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Best Demonstrated Available Technology (BDAT) Background Document for U and P Wastes and Multi-Source Leachate (F039) Volume C. Nonwastewater Forms of Organic U and P Wastes and Multi-Source Leachate (F039) for Which There Are Concentration-Based Treatment Standards

Versar, Inc., Springfield, VA

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This background document provides the Agency's technical support and rationale for the development of treatment standards for the constituents to be regulated for the above-mentioned wastes.
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FINAL

BEST DEMONSTRATED AVAILABLE TECHNOLOGY (BDAT)
BACKGROUND DOCUMENT
FOR
U AND P WASTES AND MULTI-SOURCE LEACHATE (F039)

VOLUME C:

NONWASTEWATER FORMS OF ORGANIC U AND P WASTES AND MULTI-SOURCE LEACHATE (F039) FOR WHICH THERE ARE CONCENTRATION-BASED TREATMENT STANDARDS

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May 1990

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1.0 INTRODUCTION

1.1 Regulatory Background

Section 3004(m) of the Resource Conservation and Recovery Act (RCRA), as amended by the Hazardous and Solid Waste Amendments (HSWA) on November 8, 1984, requires the U.S. Environmental Protection Agency (EPA or the Agency) to promulgate treatment standards for certain hazardous wastes based on the Best Demonstrated Available Technology (BDAT) for those wastes. More than 500 of these hazardous wastes were listed as of December 1988 (see Title 40, Code of Federal Regulations, Part 261 (40 CFR Part 261)). The Agency divided the listed hazardous wastes into five groups. The wastes in each group were examined to determine whether further land disposal is protective of human health and the environment (see 40 CFR Part 268). The five groups and their respective dates of promulgation of treatment standards are:

• Solvent and dioxin wastes	November 7, 1986
• "California List" wastes	July 8, 1987
• "First Third" wastes	August 8, 1988
• "Second Third" wastes	June 8, 1989
• "Third Third" wastes	On or before May 8, 1990

Several wastes included in this schedule were regulated ahead of schedule, and several wastes in the "First Third" or "Second Third" group of wastes were deferred to the "Third Third" group of wastes. Treatment standards for the Third Third wastes will become effective no later than May 8, 1990. On and after this date, wastes regulated in the "Third Third" rulemaking will have to comply with applicable treatment standards prior to "land disposal" as defined in 40 CFR Part 268.

This document provides the Agency's rationale and technical support for developing concentration-based treatment standards for organic constituents in U and P nonwastewaters, for lead in U051 nonwastewaters, and for constituents in multi-source leachate nonwastewaters (F039). These standards are applicable to the wastes as listed as well as to any wastes generated by the management or treatment of the listed wastes. For the purpose of determining the applicability of the treatment standards, →

con't on pg 1-2.

con't from pg 1-1

wastewaters are defined as wastes containing less than 1% (weight basis) total suspended solids[1] and less than 1% (weight basis) total organic carbon (TOC). Wastes not meeting the wastewater definition must comply with treatment standards for nonwastewaters.

In general, numerical treatment standards were developed for wastes that are amenable to quantification in hazardous waste matrices, and treatment standards specifying methods of treatment were developed for wastes that are not amenable to quantification in hazardous waste matrices using current analytical methods.

The Agency's legal authority and promulgated methodology for establishing treatment standards and the petition process for requesting a variance from the treatment standards are summarized in EPA's Methodology for Developing BDAT Treatment Standards (Reference 2).

U wastes include discarded commercial chemical products, manufacturing intermediates, off-specification commercial products, container or inner liner residues, and residues, contaminated water, soil, or debris resulting from a cleanup of a spill that are identified as toxic wastes. P wastes include discarded commercial chemical products, manufacturing intermediates, off-specification commercial products, container or inner liner residues, and residues, contaminated water, soil, or debris resulting from a cleanup of a spill that are identified as acutely hazardous wastes.

Multi-source leachate (F039) is any liquid, including any suspended components in the liquid, that has percolated through, or drained from the treatment, storage, or disposal of more than one listed hazardous waste.

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[1] The term "total suspended solids" (TSS) clarifies EPA's previously used terminology of "total solids" and "filterable solids." Specifically, total suspended solids are measured by Method 209c (Total Suspended Solids Dried at 103 to 105°C) in Standard Methods for the Examination of Water and Wastewater (Reference 1).

1.2 User's Guide to the Five-Volume U and P Waste and Multi-Source Leachate (F039) Background Document Set

In the interest of clarity, the Agency has reorganized the "Third Third" background documents that were prepared for proposal of the Third Third Rule. Multi-Source leachate (F039) and the majority of the U and P waste codes addressed in the Third Third Rule are now covered in a five-volume set of background documents.

The five-volume background document set is organized as follows.

- Volume A - Wastewater forms of organic U and P wastes and multi-source leachate (F039) for which there are concentration-based treatment standards;
- Volume B - U and P wastewaters and nonwastewaters with methods of treatment as treatment standards;
- Volume C (this document) - Nonwastewater forms of organic U and P wastes and multi-source leachate (F039) for which there are concentration-based treatment standards;
- Volume D - Reactive U and P wastewaters and nonwastewaters with methods of treatment as treatment standards; and
- Volume E - Gases.

Volumes A, B, and C each have a set of cross-referenced tables that are intended as a guide to help the reader locate a particular waste code or constituent and its treatment standard, for the codes included within the first three volumes of the set. These tables list the volume in which the nonwastewater and wastewater forms of each waste code and multi-source leachate (F039) are discussed, and the corresponding regulated constituents and treatment standards. Table 1-1 is organized by waste code. Table 1-2 is organized alphabetically by regulated constituent. (All tables are presented at the end of Section 1.0.)

1.3 Summary of Contents: Volume C

This background document provides the Agency's rationale and technical support for selecting constituents for regulation and for developing concentration-based treatment standards for the nonwastewater forms of organic U and P wastes and for the nonwastewater forms of multi-source leachate (F039) listed in Table 1-3.

A description of the industry that may be affected by these land disposal restrictions, the processes generating these wastes, and the available waste characterization data is presented in Section 2.0. Section 2.0 also includes EPA's rationale for combining the waste codes included in this document into twelve treatability groups.

EPA's rationale for identifying BDAT for wastes included in this document is presented in Section 3.0. Specifically, BDAT has been identified as incineration for organic constituents in nonwastewater U and P wastes and in multi-source leachate (F039), and as stabilization for metal constituents in U051 and multi-source leachate (F039).

Section 4.0 contains treatment performance data the Agency used to determine BDAT and to calculate treatment standards for the wastes included in this document. The Agency has treatment performance data from two rotary kiln incineration tests EPA performed in June 1989 for waste constituents from several of the waste treatability groups. The Agency also has treatment performance data from 12 other incineration tests performed by EPA for previous rulemakings for the BDAT program.

EPA's rationale for selecting constituents for regulation is presented in Section 5.0. Due to the lack of characterization data for U and P nonwastewaters, only the constituent for which the waste was listed was considered for regulation, with the exceptions of U051, U052, U060, U061, U084, U129, P050, P051, and P059, for which additional constituents were selected for regulation.

Multi-source leachate (F039) constituents selected for regulation are presented in Table 5-2. The Agency believes that regulation of these constituents will control the remaining constituents, as presented in Table 5-3.

Section 6.0 includes the calculation of treatment standards for the regulated constituents in the nonwastewater forms of the U and P wastes and the nonwastewater forms of multi-source leachate (F039) listed in Table 1-3. The units used for total constituent concentration of organic constituents are mg/kg (parts per million on a weight-by-weight basis) for the nonwastewater forms of these wastes. BDAT treatment standards for U and P wastes and multi-source leachate included in this document were determined based on treatment performance data (discussed in Section 4.0).

Generally, if a U or P waste constituent is on the BDAT List, the Agency prefers to develop a concentration-based treatment standard for that constituent, rather than a treatment standard specified as a method of treatment. However, it may not always be appropriate to set concentration-based treatment standards for certain constituents, as discussed in Volume B: U and P Wastewaters and Nonwastewaters with Methods of Treatment as Treatment Standards.

For two waste codes, U240 (2,4-dichlorophenoxyacetic acid and salts and esters) and P047 (4,6-dinitro-o-cresol and salts), the Agency is specifying both concentration-based treatment standards and a method of treatment as the treatment standard. Because 2,4-dichlorophenoxyacetic acid salts and esters and 4,6-dinitro-o-cresol salts are not analyzed as 2,4-dichlorophenoxyacetic acid or 4,6-dinitro-o-cresol, numerical treatment standards for 2,4-dichlorophenoxyacetic acid and 4,6-dinitro-o-cresol do not necessarily represent treatment of salts and esters of these wastes. Where a facility can reasonably assume that only 2,4-dichlorophenoxyacetic acid or 4,6-dinitro-o-cresol is being handled, only the concentration-based treatment standards for 2,4-dichlorophenoxyacetic acid and 4,6-dinitro-o-cresol (as discussed in this volume) would apply. However, should one expect that salts or esters could be formed during storage, treatment, or disposal, the U240 and

P047 nonwastewaters would have to be incinerated, in accordance with the BDAT treatment standard discussed in Volume B.

Section 7.0 acknowledges the persons involved in developing the regulation for these wastes. Section 8.0 includes references cited in this document.

Industries that may generate the wastes regulated under the Third Third Land Disposal Restrictions rule, and the approximate number and geographic distribution of the facilities, are listed in Appendix A. The chemical structures of the U and P wastes included in this background document are listed in Appendix B. Appendix C contains treatment performance data to supplement the data presented in Section 4.0. Appendix D includes relevant QA/QC information corresponding to treatment performance data presented in Section 4.0. Appendix E includes variability factor calculations corresponding to treatment standard calculations presented in Section 6.0.

Table 1-1

TREATMENT STANDARDS FOR U AND P WASTES AND MULTI-SOURCE LEACHATE (F039) INCLUDED IN VOLUMES A, B, AND C; BY WASTE CODE

Waste Code	Regulated Constituents	Wastewater		Nonwastewater	
		Document	Treatment Standard (mg/l) *	Document	Treatment Standard (mg/kg) **
F039	Multi-Source Leachate Constituents - Refer to Table 1-2 for Treatment Standards for each Regulated Constituent				
P001	Warfarin (>0.3%)	B	BDAT	B	BDAT-FS
P002	1-Acetyl-2-thiourea	B	BDAT	B	BDAT
P003	Acrolein	A	0.29	B	BDAT-FS
P004	Aldrin	A	0.021	C	0.066
P005	Allyl alcohol	B	BDAT	B	BDAT-FS
P007	5-Aminomethyl-3-isoxazolol	B	BDAT	B	BDAT
P008	4-Aminopyridine	B	BDAT	B	BDAT
P014	Thiophenol (Benzenethiol)	B	BDAT	B	BDAT
P016	Bis(chloromethyl)ether	B	BDAT	B	BDAT
P017	Bromoacetone	B	BDAT	B	BDAT
P018	Brucine	B	BDAT	B	BDAT
P020	2-sec-Butyl-4,6-dinitrophenol (Dinoseb)	A	0.066	C	2.5
P022	Carbon disulfide	A	0.014	B	BDAT
P023	Chloroacetaldehyde	B	BDAT	B	BDAT
P024	p-Chloroaniline	A	0.46	C	16
P026	1-(o-Chlorophenyl)thiourea	B	BDAT	B	BDAT
P027	3-Chloropropionitrile	B	BDAT	B	BDAT
P028	Benzyl chloride	B	BDAT	B	BDAT
P034	2-Cyclohexyl-4,6-dinitrophenol	B	BDAT	B	BDAT
P037	Dieldrin	A	0.017	C	0.13
P042	Epinephrine	B	BDAT	B	BDAT
P045	Thiofanox	B	BDAT	B	BDAT
P046	alpha,alpha-Dimethylphenethylamine	B	BDAT	B	BDAT
P047	4,6-Dinitro-o-cresol	A	0.28	C	160
P047	4,6-Dinitro-o-cresol salts	B	BDAT	B	BDAT
P048	2,4-Dinitrophenol	A	0.12	C	160
P049	2,4-Dithiobiuret	B	BDAT	B	BDAT
P050	Endosulfan I	A	0.023	C	0.066
P050	Endosulfan II	A	0.029	C	0.13
P050	Endosulfan sulfate	A	0.029	C	0.13
P051	Endrin	A	0.0028	C	0.13
P051	Endrin aldehyde	A	0.025	C	0.13
P054	Aziridine	B	BDAT	B	BDAT
P057	Fluoroacetamide	B	BDAT	B	BDAT
P058	Fluoroacetic acid, sodium salt	B	BDAT	B	BDAT
P059	Heptachlor	A	0.0012	C	0.066
P059	Heptachlor epoxide	A	0.016	C	0.066
P060	Isodrin	A	0.021	C	0.066
P064	Isocyanic acid, methyl ester	B	BDAT	B	BDAT
P066	Methomyl	B	BDAT	B	BDAT
P067	2-Methylaziridine	B	BDAT	B	BDAT
P069	Methyllactonitrile	B	BDAT	B	BDAT
P070	Aldicarb	B	BDAT	B	BDAT

* BDAT for wastewaters is wet air or chemical oxidation followed by carbon adsorption or incineration.

** BDAT for nonwastewaters is incineration but fuel substitution is also BDAT for the waste codes marked as BDAT-FS.

Table 1-1 (Continued)
TREATMENT STANDARDS FOR U AND P WASTES AND MULTI-SOURCE LEACHATE (F039) INCLUDED IN VOLUMES A, B, AND C; BY WASTE CODE

		Wastewater		Nonwastewater	
Waste Code	Regulated Constituents	Document	Treatment Standard (mg/l) *	Document	Treatment Standard (mg/kg) **
P072	1-Naphthyl-2-thiourea	B	BDAT	B	BDAT
P075	Nicotine and salts	B	BDAT	B	BDAT
P077	p-Nitroaniline	A	0.028	C	28
P082	N-Nitrosodimethylamine	A	0.40	B	BDAT
P084	N-Nitrosomethylvinylamine	B	BDAT	B	BDAT
P088	Endothall	B	BDAT	B	BDAT-FS
P093	N-Phenylthiourea	B	BDAT	B	BDAT
P095	Phosgene	B	BDAT	B	BDAT
P101	Ethyl cyanide (Propanenitrile)	A	0.24	C	360
P102	Propargyl alcohol	B	BDAT	B	BDAT-FS
P108	Strychnine and salts	B	BDAT	B	BDAT
P116	Thiosemicarbazide	B	BDAT	B	BDAT
P118	Trichloromethanethiol	B	BDAT	B	BDAT
P123	Toxaphene	A	0.0095	C	1.3
U001	Acetaldehyde	B	BDAT	B	BDAT
U002	Acetone	A	0.28	C	160
U003	Acetonitrile	A	0.17	B	BDAT
U004	Acetophenone	A	0.010	C	9.7
U005	2-Acetylaminofluorene	A	0.059	C	140
U006	Acetyl chloride	B	BDAT	B	BDAT
U007	Acrylamide	B	BDAT	B	BDAT
U008	Acrylic acid	B	BDAT	B	BDAT-FS
U009	Acrylonitrile	A	0.24	C	84
U010	Mitomycin C	B	BDAT	B	BDAT
U011	Amitrole	B	BDAT	B	BDAT
U012	Aniline	A	0.81	C	14
U014	Auramine	B	BDAT	B	BDAT
U015	Azaserine	B	BDAT	B	BDAT
U016	Benz(c)acridine	B	BDAT	B	BDAT-FS
U017	Benzal chloride	B	BDAT	B	BDAT
U018	Benz(a)anthracene	A	0.059	C	8.2
U019	Benzene	A	0.14	C	36
U020	Benzene sulfonyl chloride	B	BDAT	B	BDAT
U021	Benzidine	B	BDAT	B	BDAT
U022	Benzo(a)pyrene	A	0.061	C	8.2
U024	Bis(2-chloroethoxy)methane	A	0.036	C	7.2
U025	Bis(2-chloroethyl)ether	A	0.033	C	7.2
U026	Chlornaphazine	B	BDAT	B	BDAT
U027	Bis(2-chloroisopropyl)ether	A	0.055	C	7.2
U029	Bromomethane (Methyl bromide)	A	0.11	C	15
U030	4-Bromophenyl phenyl ether	A	0.055	C	15
U031	n-Butyl alcohol	A	5.6	C	2.6
U033	Carbonyl fluoride	B	BDAT	B	BDAT
U034	Trichloroacetaldehyde (Chloral)	B	BDAT	B	BDAT
U035	Chlorambucil	B	BDAT	B	BDAT

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* BDAT for wastewaters is wet air or chemical oxidation followed by carbon adsorption or incineration.

** BDAT for nonwastewaters is incineration but fuel substitution is also BDAT for the waste codes marked as BDAT-FS.

Table 1-1 (Continued)
TREATMENT STANDARDS FOR U AND P WASTES AND MULTI-SOURCE LEACHATE (F039) INCLUDED IN VOLUMES A, B, AND C; BY WASTE CODE

		Wastewater		Nonwastewater	
Waste Code	Regulated Constituents	Document	Treatment Standard (mg/l) *	Document	Treatment Standard (mg/kg) **
U036	Chlordane (alpha and gamma)	A	0.0033	C	0.13
U037	Chlorobenzene	A	0.057	C	5.7
U038	Chlorobenzilate	A	0.10	B	BDAT
U039	p-Chloro-m-cresol	A	0.018	C	14
U041	1-Chloro-2,3-epoxypropane (Epichlorohydrin)	B	BDAT	B	BDAT
U042	2-Chloroethyl vinyl ether	B	BDAT	B	BDAT
U043	Vinyl chloride	A	0.27	C	33
U044	Chloroform	A	0.046	C	5.6
U045	Chloromethane (Methyl chloride)	A	0.19	C	33
U046	Chloromethyl methyl ether	B	BDAT	B	BDAT
U047	2-Chloronaphthalene	A	0.055	C	5.6
U048	2-Chlorophenol	A	0.044	C	5.7
U049	4-Chloro-o-toluidine hydrochloride	B	BDAT	B	BDAT
U050	Chrysene	A	0.059	C	8.2
U051	Creosote - Lead	A	0.28	C	0.51 @
U051	Creosote - Naphthalene	A	0.059	C	3.1
U051	Creosote - Pentachlorophenol	A	0.089	C	7.4
U051	Creosote - Phenanthrene	A	0.059	C	3.1
U051	Creosote - Pyrene	A	0.067	C	8.2
U051	Creosote - Toluene	A	0.080	C	28
U051	Creosote - Xylenes (total)	A	0.32	C	28
U052	Cresol (m- and p- isomers)	A	0.77	C	3.2
U052	o-Cresol	A	0.11	C	5.6
U053	Crotonaldehyde	B	BDAT	B	BDAT-FS
U055	Cumene	B	BDAT	B	BDAT-FS
U056	Cyclohexane	B	BDAT	B	BDAT-FS
U057	Cyclohexanone	A	0.36	B	BDAT-FS
U059	Daunomycin	B	BDAT	B	BDAT
U060	o,p'-DDD	A	0.023	C	0.087
U060	p,p'-DDD	A	0.023	C	0.087
U061	o,p'-DDD	A	0.023	C	0.087
U061	p,p'-DDD	A	0.023	C	0.087
U061	o,p'-DDE	A	0.031	C	0.087
U061	p,p'-DDE	A	0.031	C	0.087
U061	o,p'-DDT	A	0.0039	C	0.087
U061	p,p'-DDT	A	0.0039	C	0.087
U062	Diallate	B	BDAT	B	BDAT
U063	Dibenz(a,h)anthracene	A	0.055	C	8.2
U064	1,2,7,8-Dibenzopyrene	B	BDAT	B	BDAT-FS
U066	1,2-Dibromo-3-chloropropane	A	0.11	C	15
U067	1,2-Dibromoethane (Ethylene Dibromide)	A	0.028	C	15
U068	Dibromomethane	A	0.11	C	15
U070	o-Dichlorobenzene	A	0.088	C	6.2
U071	m-Dichlorobenzene	A	0.036	C	6.2
U072	p-Dichlorobenzene	A	0.090	C	6.2

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* BDAT for wastewaters is wet air or chemical oxidation followed by carbon adsorption or incineration.

** BDAT for nonwastewaters is incineration but fuel substitution is also BDAT for the waste codes marked as BDAT-FS.

@ Units for the lead standard are mg/l; analyzed by TCLP extract.

Table 1-1 (Continued)

TREATMENT STANDARDS FOR U AND P WASTES AND MULTI-SOURCE LEACHATE (F039)
INCLUDED IN VOLUMES A, B, AND C; BY WASTE CODE

		Wastewater		Nonwastewater	
Waste Code	Regulated Constituents	Document	Treatment Standard (mg/l) *	Document	Treatment Standard (mg/kg) **
U073	3,3'-Dichlorobenzidine	B	BDAT	B	BDAT
U074	cis-1,4-Dichloro-2-butene	B	BDAT	B	BDAT
U074	trans-1,4-Dichloro-2-butene	B	BDAT	B	BDAT
U075	Dichlorodifluoromethane	A	0.23	C	7.2
U076	1,1-Dichloroethane	A	0.059	C	7.2
U077	1,2-Dichloroethane	A	0.21	C	7.2
U078	1,1-Dichloroethylene	A	0.025	C	33
U079	trans-1,2-Dichloroethylene	A	0.054	C	33
U080	Methylene chloride	A	0.089	C	33
U081	2,4-Dichlorophenol	A	0.044	C	14
U082	2,6-Dichlorophenol	A	0.044	C	14
U083	1,2-Dichloropropane	A	0.85	C	18
U084	cis-1,3-Dichloropropylene	A	0.036	C	18
U084	trans-1,3-Dichloropropylene	A	0.036	C	18
U085	1,2:3,4-Diepoxybutane	B	BDAT	B	BDAT-FS
U089	Diethylstilbestrol	B	BDAT	B	BDAT
U090	Dihydrosafrole	B	BDAT	B	BDAT
U091	3,3'-Dimethoxybenzidine	B	BDAT	B	BDAT
U092	Dimethylamine	B	BDAT	B	BDAT
U093	p-Dimethylaminoazobenzene	B	BDAT	B	BDAT
U094	7,12-Dimethyl benz(a)anthracene	B	BDAT	B	BDAT-FS
U095	3,3'-Dimethylbenzidine	B	BDAT	B	BDAT
U097	Dimethylcarbamoyl chloride	B	BDAT	B	BDAT
U101	2,4-Dimethylphenol	A	0.036	C	14
U105	2,4-Dinitrotoluene	A	0.32	C	140
U106	2,6-Dinitrotoluene	A	0.55	C	28
U108	1,4-Dioxane	A	0.12	C	170
U110	Dipropylamine	B	BDAT	B	BDAT
U111	Di-n-propylnitrosamine	A	0.40	C	14
U112	Ethyl acetate	A	0.34	C	33
U113	Ethyl acrylate	B	BDAT	B	BDAT-FS
U114	Ethylene bis-dithiocarbamic acid	B	BDAT	B	BDAT
U115	Ethylene oxide	A	0.12	@	@
U116	Ethylene thiourea	B	BDAT	B	BDAT
U117	Ethyl ether	A	0.12	C	160
U118	Ethyl methacrylate	A	0.14	C	160
U119	Ethyl methanesulfonate	B	BDAT	B	BDAT
U120	Fluoranthene	A	0.068	C	8.2
U121	Trichloromonofluoromethane	A	0.020	C	33
U122	Formaldehyde	B	BDAT	B	BDAT-FS
U123	Formic acid	B	BDAT	B	BDAT-FS
U124	Furan	B	BDAT	B	BDAT-FS
U125	Furfural	B	BDAT	B	BDAT-FS
U126	Glycidylaldehyde	B	BDAT	B	BDAT-FS

* BDAT for wastewaters is wet air or chemical oxidation followed by carbon adsorption or incineration.

** BDAT for nonwastewaters is incineration but fuel substitution is also BDAT for the waste codes marked as BDAT-FS.

@ Constituent is regulated in the wastewater form but not in the nonwastewater form.

Table 1-1 (Continued)

TREATMENT STANDARDS FOR U AND P WASTES AND MULTI-SOURCE LEACHATE (F039)
INCLUDED IN VOLUMES A, B, AND C; BY WASTE CODE

		Wastewater		Nonwastewater	
Waste Code	Regulated Constituents	Document	Treatment Standard (mg/l) *	Document	Treatment Standard (mg/kg) **
U127	Hexachlorobenzene	A	0.055	C	37
U128	Hexachlorobutadiene	A	0.055	C	28
U129	alpha-BHC	A	0.00014	C	0.066
U129	beta-BHC	A	0.00014	C	0.066
U129	delta-BHC	A	0.023	C	0.066
U129	gamma-BHC (Lindane)	A	0.0017	C	0.066
U130	Hexachlorocyclopentadiene	A	0.057	C	3.6
U131	Hexachloroethane	A	0.055	C	28
U132	Hexachlorophene	B	BDAT	B	BDAT
U137	Indeno(1,2,3-c,d)pyrene	A	0.0055	C	8.2
U138	Iodomethane	A	0.19	C	65
U140	Isobutyl alcohol	A	5.6	C	170
U141	Isosafrole	A	0.081	C	2.6
U142	Kepone	A	0.0011	C	0.13
U143	Lasiocarpine	B	BDAT	B	BDAT
U147	Maleic anhydride	B	BDAT	B	BDAT-FS
U148	Maleic hydrazide	B	BDAT	B	BDAT
U149	Malononitrile	B	BDAT	B	BDAT
U150	Melphalan	B	BDAT	B	BDAT
U152	Methacrylonitrile	A	0.24	C	84
U153	Methanethiol	B	BDAT	B	BDAT
U154	Methanol	A	5.6	B	BDAT-FS
U155	Methapyrilene	A	0.081	C	1.5
U156	Methyl chlorocarbonate	B	BDAT	B	BDAT
U157	3-Methylcholanthrene	A	0.0055	C	15
U158	4,4'-Methylenebis(2-chloroaniline)	A	0.50	C	35
U159	Methyl ethyl ketone	A	0.28	C	36
U161	Methyl isobutyl ketone	A	0.14	C	33
U162	Methyl methacrylate	A	0.14	C	160
U163	N-Methyl-N-nitro-N-nitrosoguanidine	B	BDAT	B	BDAT
U164	Methylthiouracil	B	BDAT	B	BDAT
U165	Naphthalene	A	0.059	C	3.1
U166	1,4-Naphthoquinone	B	BDAT	B	BDAT
U167	1-Naphthylamine	B	BDAT	B	BDAT
U168	2-Naphthylamine	A	0.52	B	BDAT
U169	Nitrobenzene	A	0.068	C	14
U170	4-Nitrophenol	A	0.12	C	29
U171	2-Nitropropane	B	BDAT	B	BDAT
U172	N-Nitrosodi-n-butylamine	A	0.40	C	17
U173	N-Nitrosodiethanolamine	B	BDAT	B	BDAT
U174	N-Nitrosodiethylamine	A	0.40	C	28
U176	N-Nitroso-N-ethylurea	B	BDAT	B	BDAT
U177	N-Nitroso-N-methylurea	B	BDAT	B	BDAT
U178	N-Nitroso-N-methylurethane	B	BDAT	B	BDAT
U179	N-Nitrosopiperidine	A	0.013	C	35

* BDAT for wastewaters is wet air or chemical oxidation followed by carbon adsorption or incineration.

** BDAT for nonwastewaters is incineration but fuel substitution is also BDAT for the waste codes marked as BDAT-FS.

Table 1-1 (Continued)
TREATMENT STANDARDS FOR U AND P WASTES AND MULTI-SOURCE LEACHATE (F039) INCLUDED IN VOLUMES A, B, AND C; BY WASTE CODE

		Wastewater		Nonwastewater	
Waste Code	Regulated Constituents	Document	Treatment Standard (mg/l) *	Document	Treatment Standard (mg/kg) **
U180	N-Nitrosopyrrolidine	A	0.013	C	35
U181	5-Nitro-o-toluidine	A	0.32	C	28
U182	Paraldehyde	B	BDAT	B	BDAT-FS
U183	Pentachlorobenzene	A	0.055	C	37
U184	Pentachloroethane	B	BDAT	B	BDAT
U185	Pentachloronitrobenzene	A	0.055	C	4.8
U186	1,3-Pentadiene	B	BDAT	B	BDAT-FS
U187	Phenacetin	A	0.081	C	16
U188	Phenol	A	0.039	C	6.2
U191	2-Picoline	B	BDAT	B	BDAT
U192	Pronamide	A	0.093	C	1.5
U193	1,3-Propane sultone	B	BDAT	B	BDAT
U194	n-Propylamine	B	BDAT	B	BDAT
U196	Pyridine	A	0.014	C	16
U197	p-Benzoquinone	B	BDAT	B	BDAT-FS
U200	Reserpine	B	BDAT	B	BDAT
U201	Resorcinol	B	BDAT	B	BDAT-FS
U202	Saccharin and salts	B	BDAT	B	BDAT
U203	Safrole	A	0.081	C	22
U206	Streptozotocin	B	BDAT	B	BDAT
U207	1,2,4,5-Tetrachlorobenzene	A	0.055	C	19
U208	1,1,1,2-Tetrachloroethane	A	0.057	C	42
U209	1,1,2,2-Tetrachloroethane	A	0.057	C	42
U210	Tetrachloroethylene	A	0.056	C	5.6
U211	Carbon tetrachloride	A	0.057	C	5.6
U213	Tetrahydrofuran	B	BDAT	B	BDAT-FS
U218	Thioacetamide	B	BDAT	B	BDAT
U219	Thiourea	B	BDAT	B	BDAT
U220	Toluene	A	0.080	C	28
U222	o-Toluidine hydrochloride	B	BDAT	B	BDAT
U225	Tribromomethane (Bromoform)	A	0.63	C	15
U226	1,1,1-Trichloroethane	A	0.054	C	5.6
U227	1,1,2-Trichloroethane	A	0.054	C	5.6
U228	Trichloroethylene	A	0.054	C	5.6
U234	sym-Trinitrobenzene	B	BDAT	B	BDAT
U236	Trypan blue	B	BDAT	B	BDAT
U237	Uracil mustard	B	BDAT	B	BDAT
U238	Ethyl carbamate	B	BDAT	B	BDAT
U239	Xylenes (total)	A	0.32	C	28
U240	2,4-Dichlorophenoxyacetic acid	A	0.72	C	10
U240	2,4-Dichlorophenoxyacetic salts and esters	B	BDAT	B	BDAT
U243	Hexachloropropene	A	0.035	C	28
U244	Thiram	B	BDAT	B	BDAT
U247	Methoxychlor	A	0.25	C	0.18
U248	Warfarin ($\leq$0.3%)	B	BDAT	B	BDAT-FS

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* BDAT for wastewaters is wet air or chemical oxidation followed by carbon adsorption or incineration.

** BDAT for nonwastewaters is incineration but fuel substitution is also BDAT for the waste codes marked as BDAT-FS.

Table 1-2
TREATMENT STANDARDS FOR U AND P WASTES AND MULTI-SOURCE LEACHATE (F039) INCLUDED IN VOLUMES A, B, AND C; ALPHABETICALLY

		Wastewater		Nonwastewater	
Regulated U and P Waste Constituents	Waste Code	Document	Treatment Standard (mg/l) *	Document	Treatment Standard (mg/kg) **
Acetaldehyde	U001	B	BDAT	B	BDAT
Acetone	U002	A	0.28	C	160
Acetonitrile	U003	A	0.17	B	BDAT
Acetophenone	U004	A	0.010	C	9.7
2-Acetylaminofluorene	U005	A	0.059	C	140
Acetyl chloride	U006	B	BDAT	B	BDAT
1-Acetyl-2-thiourea	P002	B	BDAT	B	BDAT
Acrolein	P003	A	0.29	B	BDAT-FS
Acrylamide	U007	B	BDAT	B	BDAT
Acrylic acid	U008	B	BDAT	B	BDAT-FS
Acrylonitrile	U009	A	0.24	C	84
Aldicarb	P070	B	BDAT	B	BDAT
Aldrin	P004	A	0.021	C	0.066
Allyl alcohol	P005	B	BDAT	B	BDAT-FS
5-Aminomethyl-3-isoxazolol	P007	B	BDAT	B	BDAT
4-Aminopyridine	P008	B	BDAT	B	BDAT
Amitrole	U011	B	BDAT	B	BDAT
Aniline	U012	A	0.81	C	14
Auramine	U014	B	BDAT	B	BDAT
Azaserine	U015	B	BDAT	B	BDAT
Aziridine	P054	B	BDAT	B	BDAT
Benzal chloride	U017	B	BDAT	B	BDAT
Benz(a)anthracene	U018	A	0.059	C	8.2
Benz(c)acridine	U016	B	BDAT	B	BDAT-FS
Benzene	U019	A	0.14	C	36
Benzene sulfonyl chloride	U020	B	BDAT	B	BDAT
Benzidine	U021	B	BDAT	B	BDAT
Benzo(a)pyrene	U022	A	0.061	C	8.2
p-Benzoquinone	U197	B	BDAT	B	BDAT-FS
Benzyl chloride	P028	B	BDAT	B	BDAT
alpha-BHC	U129	A	0.00014	C	0.066
beta-BHC	U129	A	0.00014	C	0.066
delta-BHC	U129	A	0.023	C	0.066
gamma-BHC	U129	A	0.0017	C	0.066
Bis(2-chloroethoxy)methane	U024	A	0.036	C	7.2
Bis(2-chloroethyl)ether	U025	A	0.033	C	7.2
Bis(2-chloroisopropyl)ether	U027	A	0.055	C	7.2
Bis(chloromethyl)ether	P016	B	BDAT	B	BDAT
Bromoacetone	P017	B	BDAT	B	BDAT
Bromomethane (Methyl bromide)	U029	A	0.11	C	15
4-Bromophenyl phenyl ether	U030	A	0.055	C	15
Brucine	P018	B	BDAT	B	BDAT
n-Butyl alcohol	U031	A	5.6	C	2.6
2-sec-Butyl-4,6-dinitrophenol (Dinoseb)	P020	A	0.066	C	2.5
Carbon disulfide	P022	B	BDAT	B	BDAT

* BDAT for wastewaters is wet air or chemical oxidation followed by carbon adsorption or incineration.

** BDAT for nonwastewaters is incineration. Fuel substitution is also BDAT for the waste codes marked as BDAT-FS.

Table 1-2 (Continued)

TREATMENT STANDARDS FOR U AND P WASTES AND MULTI-SOURCE LEACHATE (F039)

INCLUDED IN VOLUMES A, B, AND C; ALPHABETICALLY

		Wastewater		Nonwastewater	
Regulated U and P Waste Constituents	Waste Code	Document	Treatment Standard (mg/l) *	Document	Treatment Standard (mg/kg) **
Carbon tetrachloride	U211	A	0.057	C	5.6
Carbonyl fluoride	U033	B	BDAT	B	BDAT
Chlorambucil	U035	B	BDAT	B	BDAT
Chlordane (alpha and gamma)	U036	A	0.0033	C	0.13
Chloroacetaldehyde	P023	B	BDAT	B	BDAT
p-Chloroaniline	P024	A	0.46	C	16
Chlorobenzene	U037	A	0.057	C	5.7
Chlorobenzilate	U038	A	0.10	B	BDAT
1-Chloro-2,3-epoxypropane (Epichlorohydrin)	U041	B	BDAT	B	BDAT
2-Chloroethyl vinyl ether	U042	B	BDAT	B	BDAT
Chloroform	U044	A	0.046	C	5.6
p-Chloro-m-cresol	U039	A	0.018	C	14
Chloromethane (Methyl chloride)	U045	A	0.19	C	33
Chloromethyl methyl ether	U046	B	BDAT	B	BDAT
Chlornaphazine	U026	B	BDAT	B	BDAT
2-Chloronaphthalene	U047	A	0.055	C	5.6
4-Chloro-o-toluidine hydrochloride	U049	B	BDAT	B	BDAT
2-Chlorophenol	U048	A	0.044	C	5.7
1-(o-Chlorophenyl)thiourea	P026	B	BDAT	B	BDAT
3-Chloropropionitrile	P027	B	BDAT	B	BDAT
Chrysene	U050	A	0.059	C	8.2
Creosote - Lead	U051	A	0.28	C	0.51 @
Creosote - Naphthalene	U051	A	0.059	C	3.1
Creosote - Pentachlorophenol	U051	A	0.089	C	7.4
Creosote - Phenanthrene	U051	A	0.059	C	3.1
Creosote - Pyrene	U051	A	0.067	C	8.2
Creosote - Toluene	U051	A	0.080	C	28
Creosote - Xylenes (total)	U051	A	0.32	C	28
Cresol (m- and p- isomers)	U052	A	0.77	C	3.2
o-Cresol	U052	A	0.11	C	5.6
Crotonaldehyde	U053	B	BDAT	B	BDAT-FS
Cumene	U055	B	BDAT	B	BDAT-FS
Cyclohexane	U056	B	BDAT	B	BDAT-FS
Cyclohexanone	U057	A	0.36	B	BDAT-FS
2-Cyclohexyl-4,6-dinitrophenol	P034	B	BDAT	B	BDAT
Daunomycin	U059	B	BDAT	B	BDAT
o,p'-DDD	U060	A	0.023	C	0.087
p,p'-DDD	U060	A	0.023	C	0.087
o,p'-DDD	U061	A	0.023	C	0.087
p,p'-DDD	U061	A	0.023	C	0.087
o,p'-DDE	U061	A	0.031	C	0.087
p,p'-DDE	U061	A	0.031	C	0.087
o,p'-DDT	U061	A	0.0039	C	0.087
p,p'-DDT	U061	A	0.0039	C	0.087

* BDAT for wastewaters is wet air or chemical oxidation followed by carbon adsorption or incineration.

** BDAT for nonwastewaters is incineration. Fuel substitution is also BDAT for the waste codes marked as BDAT-FS.

@ Units for the lead standard are mg/l, analyzed by TCLP extract.

Table 1-2 (Continued)
TREATMENT STANDARDS FOR U AND P WASTES AND MULTI-SOURCE LEACHATE (F039) INCLUDED IN VOLUMES A, B, AND C; ALPHABETICALLY

		Wastewater		Nonwastewater	
Regulated U and P Waste Constituents	Waste Code	Document	Treatment Standard (mg/l) *	Document	Treatment Standard (mg/kg) **
Diallate	U062	B	BDAT	B	BDAT
Dibenz(a,h)anthracene	U063	A	0.055	C	8.2
1,2,7,8-Dibenzopyrene	U064	B	BDAT	B	BDAT-FS
1,2-Dibromo-3-chloropropane	U066	A	0.11	C	15
1,2-Dibromoethane (Ethylene dibromide)	U067	A	0.028	C	15
Dibromomethane	U068	A	0.11	C	15
m-Dichlorobenzene	U071	A	0.036	C	6.2
o-Dichlorobenzene	U070	A	0.088	C	6.2
p-Dichlorobenzene	U072	A	0.090	C	6.2
3,3'-Dichlorobenzidine	U073	B	BDAT	B	BDAT
cis-1,4-Dichloro-2-butene	U074	B	BDAT	B	BDAT
trans-1,4-Dichloro-2-butene	U074	B	BDAT	B	BDAT
Dichlorodifluoromethane	U075	A	0.23	C	7.2
1,1-Dichloroethane	U076	A	0.059	C	7.2
1,2-Dichloroethane	U077	A	0.21	C	7.2
1,1-Dichloroethylene	U078	A	0.025	C	33
trans-1,2-Dichloroethylene	U079	A	0.054	C	33
2,4-Dichlorophenol	U081	A	0.044	C	14
2,6-Dichlorophenol	U082	A	0.044	C	14
2,4-Dichlorophenoxyacetic acid	U240	A	0.72	C	10
2,4-Dichlorophenoxyacetic salts and esters	U240	B	BDAT	B	BDAT
1,2-Dichloropropane	U083	A	0.85	C	18
cis-1,3-Dichloropropylene	U084	A	0.036	C	18
trans-1,3-Dichloropropylene	U084	A	0.036	C	18
Dieldrin	P037	A	0.017	C	0.13
1,2:3,4-Diepoxybutane	U085	B	BDAT	B	BDAT-FS
Diethylstilbestrol	U089	B	BDAT	B	BDAT
Dihydrosafrole	U090	B	BDAT	B	BDAT
3,3'-Dimethoxybenzidine	U091	B	BDAT	B	BDAT
Dimethylamine	U092	B	BDAT	B	BDAT
p-Dimethylaminoazobenzene	U093	B	BDAT	B	BDAT
7,12-Dimethyl benz(a)anthracene	U094	B	BDAT	B	BDAT-FS
3,3'-Dimethylbenzidine	U095	B	BDAT	B	BDAT
Dimethylcarbamoyl chloride	U097	B	BDAT	B	BDAT
alpha,alpha-Dimethylphenethylamine	P046	B	BDAT	B	BDAT
2,4-Dimethylphenol	U101	A	0.036	C	14
4,6-Dinitro-o-cresol	P047	A	0.28	C	160
4,6-Dinitro-o-cresol salts	P047	B	BDAT	B	BDAT
2,4-Dinitrophenol	P048	A	0.12	C	160
2,4-Dinitrotoluene	U105	A	0.32	C	140
2,6-Dinitrotoluene	U106	A	0.55	C	28
Di-n-propylnitrosamine	U111	A	0.40	C	14
1,4-Dioxane	U108	A	0.12	C	170
Dipropylamine	U110	B	BDAT	B	BDAT
2,4-Dithiobiuret	P049	B	BDAT	B	BDAT

* BDAT for wastewaters is wet air or chemical oxidation followed by carbon adsorption or incineration.

** BDAT for nonwastewaters is incineration. Fuel substitution is also BDAT for the waste codes marked as BDAT-FS.

Table 1-2 (Continued)
TREATMENT STANDARDS FOR U AND P WASTES AND MULTI-SOURCE LEACHATE (F039)
INCLUDED IN VOLUMES A, B, AND C; ALPHABETICALLY

		Wastewater		Nonwastewater	
Regulated U and P Waste Constituents	Waste Code	Document	Treatment Standard (mg/l) *	Document	Treatment Standard (mg/kg) **
Endosulfan I	P050	A	0.023	C	0.066
Endosulfan II	P050	A	0.029	C	0.13
Endosulfan sulfate	P050	A	0.029	C	0.13
Endothall	P088	B	BDAT	B	BDAT-FS
Endrin	P051	A	0.0028	C	0.13
Endrin aldehyde	P051	A	0.025	C	0.13
Epinephrine	P042	B	BDAT	B	BDAT
Ethyl acetate	U112	A	0.34	C	33
Ethyl acrylate	U113	B	BDAT	B	BDAT-FS
Ethyl carbamate	U238	B	BDAT	B	BDAT
Ethyl cyanide (Propanenitrile)	P101	A	0.24	C	360
Ethyl ether	U117	A	0.12	C	160
Ethyl methacrylate	U118	A	0.14	C	160
Ethyl methanesulfonate	U119	B	BDAT	B	BDAT
Ethylene bis-dithiocarbamic acid	U114	B	BDAT	B	BDAT
Ethylene oxide	U115	A	0.12	@	@
Ethylene thiourea	U116	B	BDAT	B	BDAT
Fluoranthene	U120	A	0.068	C	8.2
Fluoroacetamide	P057	B	BDAT	B	BDAT
Fluoroacetic acid, sodium salt	P058	B	BDAT	B	BDAT
Formaldehyde	U122	B	BDAT	B	BDAT-FS
Formic acid	U123	B	BDAT	B	BDAT-FS
Furan	U124	B	BDAT	B	BDAT-FS
Furfural	U125	B	BDAT	B	BDAT-FS
Glycidylaldehyde	U126	B	BDAT	B	BDAT-FS
Heptachlor	P059	A	0.0012	C	0.066
Heptachlor epoxide	P059	A	0.016	C	0.066
Hexachlorobenzene	U127	A	0.055	C	37
Hexachlorobutadiene	U128	A	0.055	C	28
Hexachlorocyclopentadiene	U130	A	0.057	C	3.6
Hexachloroethane	U131	A	0.055	C	28
Hexachlorophene	U132	B	BDAT	B	BDAT
Hexachloropropene	U243	A	0.035	C	28
Indeno(1,2,3-c,d)pyrene	U137	A	0.0055	C	8.2
Iodomethane	U138	A	0.19	C	65
Isobutyl alcohol	U140	A	5.6	C	170
Isocyanic acid, methyl ester	P064	B	BDAT	B	BDAT
Isodrin	P060	A	0.021	C	0.066
Isosafrole	U141	A	0.081	C	2.6
Kepone	U142	A	0.0011	C	0.13
Lasiocarpine	U143	B	BDAT	B	BDAT
Maleic anhydride	U147	B	BDAT	B	BDAT-FS
Maleic hydrazide	U148	B	BDAT	B	BDAT
Malononitrile	U149	B	BDAT	B	BDAT

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* BDAT for wastewaters is wet air or chemical oxidation followed by carbon adsorption or incineration.

** BDAT for nonwastewaters is incineration. Fuel substitution is also BDAT for the waste codes marked as BDAT-FS.

@ Constituent is regulated in the wastewater form, but not in the nonwastewater form.

Table 1-2 (Continued)

TREATMENT STANDARDS FOR U AND P WASTES AND MULTI-SOURCE LEACHATE (F039) INCLUDED IN VOLUMES A, B, AND C; ALPHABETICALLY

		Wastewater		Nonwastewater	
Regulated U and P Waste Constituents	Waste Code	Document	Treatment Standard (mg/l) *	Document	Treatment Standard (mg/kg) **
Melphalan	U150	B	BDAT	B	BDAT
Methacrylonitrile	U152	A	0.24	C	84
Methanethiol	U153	B	BDAT	B	BDAT
Methanol	U154	A	5.6	B	BDAT-FS
Methapyrilene	U155	A	0.081	C	1.5
Methomyl	P066	B	BDAT	B	BDAT
Methoxychlor	U247	A	0.25	C	0.18
Methyl chlorocarbonate	U156	B	BDAT	B	BDAT
Methyl ethyl ketone	U159	A	0.28	C	36
Methyl isobutyl ketone	U161	A	0.14	C	33
Methyl methacrylate	U162	A	0.14	C	160
2-Methylaziridine	P067	B	BDAT	B	BDAT
3-Methylcholanthrene	U157	A	0.0055	C	15
4,4'-Methylenebis(2-chloroaniline)	U158	A	0.50	C	35
Methylene chloride	U080	A	0.089	C	33
Methyllactonitrile	P069	B	BDAT	B	BDAT
N-Methyl-N-nitro-N-nitrosoguanidine	U163	B	BDAT	B	BDAT
Methylthiouracil	U164	B	BDAT	B	BDAT
Mitomycin C	U010	B	BDAT	B	BDAT
Naphthalene	U165	A	0.059	C	3.1
1,4-Naphthoquinone	U166	B	BDAT	B	BDAT-FS
1-Naphthylamine	U167	B	BDAT	B	BDAT
2-Naphthylamine	U168	A	0.52	B	BDAT
1-Naphthyl-2-thiourea	P072	B	BDAT	B	BDAT
Nicotine and salts	P075	B	BDAT	B	BDAT
p-Nitroaniline	P077	A	0.028	C	28
Nitrobenzene	U169	A	0.068	C	14
5-Nitro-o-toluidine	U181	A	0.32	C	28
4-Nitrophenol	U170	A	0.12	C	29
2-Nitropropane	U171	B	BDAT	B	BDAT
N-Nitrosodiethanolamine	U173	B	BDAT	B	BDAT
N-Nitrosodiethylamine	U174	A	0.40	C	28
N-Nitrosodimethylamine	P082	A	0.40	B	BDAT
N-Nitrosodi-n-butylamine	U172	A	0.40	C	17
N-Nitrosomethylvinylamine	P084	B	BDAT	B	BDAT
N-Nitroso-N-ethylurea	U176	B	BDAT	B	BDAT
N-Nitroso-N-methylurea	U177	B	BDAT	B	BDAT
N-Nitroso-N-methylurethane	U178	B	BDAT	B	BDAT
N-Nitrosopiperidine	U179	A	0.013	C	35
N-Nitrosopyrrolidine	U180	A	0.013	C	35
Paraldehyde	U182	B	BDAT	B	BDAT-FS
Pentachloroethane	U184	B	BDAT	B	BDAT
Pentachlorobenzene	U183	A	0.055	C	37
Pentachloronitrobenzene	U185	A	0.055	C	4.8
1,3-Pentadiene	U186	B	BDAT	B	BDAT-FS

* BDAT for wastewaters is wet air or chemical oxidation followed by carbon adsorption or incineration.

** BDAT for nonwastewaters is incineration. Fuel substitution is also BDAT for the waste codes marked as BDAT-FS.

Table 1-2 (Continued)

TREATMENT STANDARDS FOR U AND P WASTES AND MULTI-SOURCE LEACHATE (F039)

INCLUDED IN VOLUMES A, B, AND C; ALPHABETICALLY

		Wastewater		Nonwastewater	
Regulated U and P Waste Constituents	Waste Code	Document	Treatment Standard (mg/l) *	Document	Treatment Standard (mg/kg) **
Phenacetin	U187	A	0.081	C	16
Phenol	U188	A	0.039	C	6.2
N-Phenylthiourea	P093	B	BDAT	B	BDAT
Phosgene	P095	B	BDAT	B	BDAT
2-Picoline	U191	B	BDAT	B	BDAT
Pronamide	U192	A	0.093	C	1.5
1,3-Propane sultone	U193	B	BDAT	B	BDAT
Propargyl alcohol	P102	B	BDAT	B	BDAT-FS
n-Propylamine	U194	B	BDAT	B	BDAT
Pyridine	U196	A	0.014	C	16
Reserpine	U200	B	BDAT	B	BDAT
Resorcinol	U201	B	BDAT	B	BDAT-FS
Saccharin and salts	U202	B	BDAT	B	BDAT
Safrole	U203	A	0.081	C	22
Streptozotocin	U206	B	BDAT	B	BDAT
Strychnine and salts	P108	B	BDAT	B	BDAT
1,2,4,5-Tetrachlorobenzene	U207	A	0.055	C	19
1,1,1,2-Tetrachloroethane	U208	A	0.057	C	42
1,1,2,2-Tetrachloroethane	U209	A	0.057	C	42
Tetrachloroethylene	U210	A	0.056	C	5.6
Tetrahydrofuran	U213	B	BDAT	B	BDAT-FS
Thioacetamide	U218	B	BDAT	B	BDAT
Thiofanox	P045	B	BDAT	B	BDAT
Thiophenol (Benzenethiol)	P014	B	BDAT	B	BDAT
Thiosemicarbazide	P116	B	BDAT	B	BDAT
Thiourea	U219	B	BDAT	B	BDAT
Thiram	U244	B	BDAT	B	BDAT
Toluene	U220	A	0.080	C	28
o-Toluidine hydrochloride	U222	B	BDAT	B	BDAT
Toxaphene	P123	A	0.0095	C	1.3
Tribromomethane (Bromoform)	U225	A	0.63	C	15
Trichloroacetaldehyde (Chloral)	U034	B	BDAT	B	BDAT
1,1,1-Trichloroethane	U226	A	0.054	C	5.6
1,1,2-Trichloroethane	U227	A	0.054	C	5.6
Trichloroethylene	U228	A	0.054	C	5.6
Trichloromethanethiol	P118	B	BDAT	B	BDAT
Trichloromonofluoromethane	U121	A	0.020	C	33
sym-Trinitrobenzene	U234	B	BDAT	B	BDAT
Trypan blue	U236	B	BDAT	B	BDAT
Uracil mustard	U237	B	BDAT	B	BDAT
Vinyl chloride	U043	A	0.27	C	33
Warfarin (>0.3%)	P001	B	BDAT	B	BDAT-FS
Warfarin (≤0.3%)	U248	B	BDAT	B	BDAT-FS
Xylenes (total)	U239	A	0.32	C	28

* BDAT for wastewaters is wet air or chemical oxidation followed by carbon adsorption or incineration.

** BDAT for nonwastewaters is incineration. Fuel substitution is also BDAT for the waste codes marked as BDAT-FS.

Table 1-2 (Continued)
TREATMENT STANDARDS FOR U AND P WASTES AND MULTI-SOURCE LEACHATE (F039) INCLUDED IN VOLUMES A, B, AND C; ALPHABETICALLY

		Wastewater		Nonwastewater	
Regulated Leachate Constituents	Waste Code	Document	Treatment Standard (mg/l)	Document	Treatment Standard (mg/kg)
Acenaphthalene	F039	A	0.059	C	3.4
Acenaphthene	F039	A	0.059	C	4.0
Acetone	F039	A	0.28	C	160
Acetonitrile	F039	A	0.17	C	NR
Acetophenone	F039	A	0.010	C	9.7
2-Acetylaminofluorene	F039	A	0.059	C	140
Acrolein	F039	A	0.29	C	NR
Acrylonitrile	F039	A	0.24	C	84
Aldrin	F039	A	0.021	C	0.066
4-Aminobiphenyl	F039	A	0.13	C	NR
Aniline	F039	A	0.810	C	14
Anthracene	F039	A	0.059	C	4.0
Aramite	F039	A	0.36	C	NR
Aroclor 1016	F039	A	0.013	C	0.92
Aroclor 1221	F039	A	0.014	C	0.92
Aroclor 1232	F039	A	0.013	C	0.92
Aroclor 1242	F039	A	0.017	C	0.92
Aroclor 1248	F039	A	0.013	C	0.92
Aroclor 1254	F039	A	0.014	C	1.8
Aroclor 1260	F039	A	0.014	C	1.8
Benz(a)anthracene	F039	A	0.059	C	8.2
Benzene	F039	A	0.140	C	36
Benzo(b)fluoranthene	F039	A	0.055	C	3.4
Benzo(k)fluoranthene	F039	A	0.059	C	3.4
Benzo(g,h,i)perylene	F039	A	0.0055	C	1.5
Benzo(a)pyrene	F039	A	0.061	C	8.2
alpha-BHC	F039	A	0.00014	C	0.066
beta-BHC	F039	A	0.00014	C	0.066
delta-BHC	F039	A	0.023	C	0.066
gamma-BHC (Lindane)	F039	A	0.0017	C	0.066
Bis(2-chloroethoxy)methane	F039	A	0.036	C	7.2
Bis(2-chloroethyl)ether	F039	A	0.033	C	7.2
Bis(2-chloroisopropyl)ether	F039	A	0.055	C	7.2
Bis(2-ethylhexyl)phthalate	F039	A	0.28	C	28
Bromodichloromethane	F039	A	0.35	C	15
Bromomethane (Methyl bromide)	F039	A	0.11	C	15
4-Bromophenyl phenyl ether	F039	A	0.055	C	15
n-Butyl alcohol	F039	A	5.6	C	2.6
Butyl benzyl phthalate	F039	A	0.017	C	7.9
2-sec-Butyl-4,6-dinitrophenol (Dinoseb)	F039	A	0.066	C	2.5
Carbon disulfide	F039	A	0.014	C	NR
Carbon tetrachloride	F039	A	0.057	C	5.6
Chlordane (alpha and gamma)	F039	A	0.0033	C	0.13
p-Chloroaniline	F039	A	0.46	C	16
Chlorobenzene	F039	A	0.057	C	5.7

NR = Not regulated. See Section 5.0 of the appropriate volume for discussion.

Table 1-2 (Continued)
TREATMENT STANDARDS FOR U AND P WASTES AND MULTI-SOURCE LEACHATE (F039) INCLUDED IN VOLUMES A, B, AND C; ALPHABETICALLY

Regulated Leachate Constituents	Waste Code	Wastewater		Nonwastewater	
		Document	Treatment Standard (mg/l)	Document	Treatment Standard (mg/kg)
Chlorobenzilate	F039	A	0.10	C	NR
2-Chloro-1,3-butadiene	F039	A	0.057	C	NR
Chlorodibromomethane	F039	A	0.057	C	15
Chloroethane	F039	A	0.27	C	6.0
Chloroform	F039	A	0.046	C	5.6
p-Chloro-m-cresol	F039	A	0.018	C	14
Chloromethane (Methyl chloride)	F039	A	0.19	C	33
2-Chloronaphthalene	F039	A	0.055	C	5.6
2-Chlorophenol	F039	A	0.044	C	5.7
3-Chloropropene	F039	A	0.036	C	28
Chrysene	F039	A	0.059	C	8.2
Cresol (m- and p- isomers)	F039	A	0.77	C	3.2
o-Cresol	F039	A	0.11	C	5.6
Cyclohexanone	F039	A	0.36	C	NR
o,p'-DDD	F039	A	0.023	C	0.087
p,p'-DDD	F039	A	0.023	C	0.087
o,p'-DDE	F039	A	0.031	C	0.087
p,p'-DDE	F039	A	0.031	C	0.087
o,p' DDT	F039	A	0.0039	C	0.087
p,p'-DDT	F039	A	0.0039	C	0.087
Dibenz(a,h)anthracene	F039	A	0.055	C	8.2
Dibenzo(a,e)pyrene	F039	A	0.061	C	NR
1,2-Dibromo-3-chloropropane	F039	A	0.11	C	15
1,2-Dibromoethane (Ethylene dibromide)	F039	A	0.028	C	15
Dibromomethane	F039	A	0.11	C	15
m-Dichlorobenzene	F039	A	0.036	C	6.2
o-Dichlorobenzene	F039	A	0.088	C	6.2
p-Dichlorobenzene	F039	A	0.090	C	6.2
Dichlorodifluoromethane	F039	A	0.23	C	7.2
1,1-Dichloroethane	F039	A	0.059	C	7.2
1,2-Dichloroethane	F039	A	0.21	C	7.2
1,1-Dichloroethylene	F039	A	0.025	C	33
trans-1,2-Dichloroethylene	F039	A	0.054	C	33
2,4-Dichlorophenol	F039	A	0.044	C	14
2,6-Dichlorophenol	F039	A	0.044	C	14
2,4-Dichlorophenoxyacetic acid	F039	A	0.72	C	10
1,2-Dichloropropane	F039	A	0.85	C	18
cis-1,3-Dichloropropene	F039	A	0.036	C	18
trans-1,3-Dichloropropene	F039	A	0.036	C	18
Dieldrin	F039	A	0.017	C	0.13
Diethyl phthalate	F039	A	0.20	C	28
2,4-Dimethylphenol	F039	A	0.036	C	14
Dimethyl phthalate	F039	A	0.047	C	28
Di-n-butyl phthalate	F039	A	0.057	C	28
1,4-Dinitrobenzene	F039	A	0.32	C	2.3

NR = Not regulated. See Section 5.0 of the appropriate volume for discussion.

Table 1-2 (Continued)
TREATMENT STANDARDS FOR U AND P WASTES AND MULTI-SOURCE LEACHATE (F039) INCLUDED IN VOLUMES A, B, AND C; ALPHABETICALLY

		Wastewater		Nonwastewater	
Regulated Leachate Constituents	Waste Code	Document	Treatment Standard (mg/l)	Document	Treatment Standard (mg/kg)
4,6-Dinitro-o-cresol	F039	A	0.28	C	160
2,4-Dinitrophenol	F039	A	0.12	C	160
2,4-Dinitrotoluene	F039	A	0.32	C	140
2,6-Dinitrotoluene	F039	A	0.55	C	28
Di-n-octyl phthalate	F039	A	0.017	C	28
Di-n-propylnitrosamine	F039	A	0.40	C	14
1,4-Dioxane	F039	A	0.12	C	170
Diphenylamine	F039	A	0.52	C	NR
1,2-Diphenylhydrazine	F039	A	0.087	C	NR
Diphenylnitrosamine	F039	A	0.40	C	NR
Disulfoton	F039	A	0.017	C	6.2
Endosulfan I	F039	A	0.023	C	0.066
Endosulfan II	F039	A	0.029	C	0.13
Endosulfan sulfate	F039	A	0.029	C	0.13
Endrin	F039	A	0.0028	C	0.13
Endrin aldehyde	F039	A	0.025	C	0.13
Ethyl acetate	F039	A	0.34	C	33
Ethyl benzene	F039	A	0.057	C	6.0
Ethyl cyanide (Propanenitrile)	F039	A	0.24	C	360
Ethyl ether	F039	A	0.12	C	160
Ethyl methacrylate	F039	A	0.14	C	160
Ethylene oxide	F039	A	0.12	C	NR
Famphur	F039	A	0.017	C	15
Fluoranthene	F039	A	0.068	C	8.2
Fluorene	F039	A	0.059	C	4.0
Heptachlor	F039	A	0.0012	C	0.066
Heptachlor epoxide	F039	A	0.016	C	0.066
Hexachlorobenzene	F039	A	0.055	C	37
Hexachlorobutadiene	F039	A	0.055	C	28
Hexachlorocyclopentadiene	F039	A	0.057	C	3.6
Hexachlorodibenzofurans	F039	A	0.000063	C	0.001
Hexachlorodibenzo-p-dioxins	F039	A	0.000063	C	0.001
Hexachloroethane	F039	A	0.055	C	28
Hexachloropropene	F039	A	0.035	C	28
Indeno(1,2,3-c,d)pyrene	F039	A	0.0055	C	8.2
Iodomethane	F039	A	0.19	C	65
Isobutyl alcohol	F039	A	5.6	C	170
Isodrin	F039	A	0.021	C	0.066
Isosafrole	F039	A	0.081	C	2.6
Kepone	F039	A	0.0011	C	0.13
Methacrylonitrile	F039	A	0.24	C	84
Methanol	F039	A	5.6	C	NR
Methapyrilene	F039	A	0.081	C	1.5
Methoxychlor	F039	A	0.25	C	0.18
Methyl ethyl ketone	F039	A	0.28	C	36

NR = Not regulated. See Section 5.0 of the appropriate volume for discussion.

Table 1-2 (Continued)

TREATMENT STANDARDS FOR U AND P WASTES AND MULTI-SOURCE LEACHATE (F039)
INCLUDED IN VOLUMES A, B, AND C; ALPHABETICALLY

		Wastewater		Nonwastewater	
Regulated Leachate Constituents	Waste Code	Document	Treatment Standard (mg/l)	Document	Treatment Standard (mg/kg)
Methyl isobutyl ketone	F039	A	0.14	C	33
Methyl methacrylate	F039	A	0.14	C	160
Methyl methanesulfonate	F039	A	0.018	C	NR
Methyl parathion	F039	A	0.014	C	4.6
3-Methylcholanthrene	F039	A	0.0055	C	15
4,4'-Methylenebis(2-chloroaniline)	F039	A	0.50	C	35
Methylene chloride	F039	A	0.089	C	33
Naphthalene	F039	A	0.059	C	3.1
2-Naphthylamine	F039	A	0.52	C	NR
p-Nitroaniline	F039	A	0.028	C	28
Nitrobenzene	F039	A	0.068	C	14
5-Nitro-o-toluidine	F039	A	0.32	C	28
4-Nitrophenol	F039	A	0.12	C	29
N-Nitrosodiethylamine	F039	A	0.40	C	28
N-Nitrosodimethylamine	F039	A	0.40	C	NR
N-Nitrosodi-n-butylamine	F039	A	0.40	C	17
N-Nitrosomethylethylamine	F039	A	0.40	C	2.3
N-Nitrosomorpholine	F039	A	0.40	C	2.3
N-Nitrosopiperidine	F039	A	0.013	C	35
N-Nitrosopyrrolidine	F039	A	0.013	C	35
Parathion	F039	A	0.014	C	4.6
Pentachlorobenzene	F039	A	0.055	C	37
Pentachlorodibenzofurans	F039	A	0.000063	C	0.001
Pentachlorodibenzo-p-dioxins	F039	A	0.000063	C	0.001
Pentachloronitrobenzene	F039	A	0.055	C	4.8
Pentachlorophenol	F039	A	0.089	C	7.4
Phenacetin	F039	A	0.081	C	16
Phenanthrene	F039	A	0.059	C	3.1
Phenol	F039	A	0.039	C	6.2
Phorate	F039	A	0.021	C	4.6
Phthalic anhydride	F039	A	0.069	C	NR
Pronamide	F039	A	0.093	C	1.5
Pyrene	F039	A	0.067	C	8.2
Pyridine	F039	A	0.014	C	16
Safrole	F039	A	0.081	C	22
Silvex (2,4,5-TP)	F039	A	0.72	C	7.9
1,2,4,5-Tetrachlorobenzene	F039	A	0.055	C	19
Tetrachlorodibenzofurans	F039	A	0.000063	C	0.001
Tetrachlorodibenzo-p-dioxins	F039	A	0.000063	C	0.001
1,1,1,2-Tetrachloroethane	F039	A	0.057	C	42
1,1,2,2-Tetrachloroethane	F039	A	0.057	C	42
Tetrachloroethylene	F039	A	0.056	C	5.6
2,3,4,6-Tetrachlorophenol	F039	A	0.030	C	37
Toluene	F039	A	0.080	C	28
Toxaphene	F039	A	0.0095	C	1.3

NR = Not regulated. See Section 5.0 of the appropriate volume for discussion.

Table 1-2 (Continued)

TREATMENT STANDARDS FOR U AND P WASTES AND MULTI-SOURCE LEACHATE (F039) INCLUDED IN VOLUMES A, B, AND C; ALPHABETICALLY

		Wastewater		Nonwastewater	
Regulated Leachate Constituents	Waste Code	Document	Treatment Standard (mg/l)	Document	Treatment Standard (mg/kg)
Tribromomethane (Bromoform)	F039	A	0.63	C	15
1,2,4-Trichlorobenzene	F039	A	0.055	C	19
1,1,1-Trichloroethane	F039	A	0.054	C	5.6
1,1,2-Trichloroethane	F039	A	0.054	C	5.6
Trichloroethylene	F039	A	0.054	C	5.6
Trichloromonofluoromethane	F039	A	0.020	C	33
2,4,5-Trichlorophenol	F039	A	0.18	C	37
2,4,6-Trichlorophenol	F039	A	0.035	C	37
2,4,5-Trichlorophenoxyacetic acid	F039	A	0.72	C	7.9
1,2,3-Trichloropropane	F039	A	0.85	C	28
1,1,2-Trichloro-1,2,2-trifluoroethane	F039	A	0.057	C	28
Tris(2,3-dibromopropyl)phosphate	F039	A	0.11	C	NR
Vinyl chloride	F039	A	0.27	C	33
Xylenes	F039	A	0.32	C	28
Cyanides (total)	F039	A	1.2	C	1.8
Fluoride	F039	A	35	C	NR
Sulfide	F039	A	14	C	NR
					TCLP (mg/l)
Antimony	F039	A	1.9	C	0.23
Arsenic	F039	A	1.4	C	5.0 @
Barium	F039	A	1.2	C	52
Beryllium	F039	A	0.82	C	NR
Cadmium	F039	A	0.20	C	0.066
Chromium (total)	F039	A	0.37	C	5.2
Copper	F039	A	1.3	C	NR
Lead	F039	A	0.28	C	0.51
Mercury	F039	A	0.15	C	0.025
Nickel	F039	A	0.55	C	0.32
Selenium	F039	A	0.82	C	5.7
Silver	F039	A	0.29	C	0.072
Thallium	F039	A	1.4	C	NR
Vanadium	F039	A	0.042	C	NR
Zinc	F039	A	1.0	C	NR

NR = Not regulated. See Section 5.0 of the appropriate volume for discussion.

@ Based on EP Toxicity.

Table 1-3

TREATMENT STANDARDS FOR U AND P NONWASTEWATERS AND MULTI-SOURCE LEACHATE (F039) INCLUDED IN VOLUME C

Waste Code	Regulated Constituent	Treatment Standard (mg/kg)
F039	Multi-Source Leachate (MSL) - Refer to Table 1-2 for the Treatment Standard for each Regulated MSL Constituent.	
P004	Aldrin	0.066
P020	2-sec-Butyl-4,6-dinitrophenol (Dinoseb)	2.5
P024	p-Chloroaniline	16
P037	Dieldrin	0.13
P047	4,6-Dinitro-o-cresol	160
P048	2,4-Dinitrophenol	160
P050	Endosulfan I	0.066
P050	Endosulfan II	0.13
P050	Endosulfan sulfate	0.13
P051	Endrin	0.13
P051	Endrin aldehyde	0.13
P059	Heptachlor	0.066
P059	Heptachlor epoxide	0.066
P060	Isodrin	0.066
P077	p-Nitroaniline	28
P101	Ethyl cyanide (Propanenitrile)	360
P123	Toxaphene	1.3
U002	Acetone	160
U004	Acetophenone	9.7
U005	2-Acetylaminofluorene	140
U009	Acrylonitrile	84
U012	Aniline	14
U018	Benz(a)anthracene	8.2
U019	Benzene	36
U022	Benzo(a)pyrene	8.2
U024	Bis(2-chloroethoxy)methane	7.2
U025	Bis(2-chloroethyl)ether	7.2
U027	Bis(2-chloroisopropyl)ether	7.2
U029	Bromomethane (Methyl bromide)	15
U030	4-Bromophenyl phenyl ether	15
U031	n-Butyl alcohol	2.6
U036	Chlordane (alpha and gamma)	0.13
U037	Chlorobenzene	5.7
U039	p-Chloro-m-cresol	14
U043	Vinyl chloride	33
U044	Chloroform	5.6
U045	Chloromethane (Methyl chloride)	33
U047	2-Chloronaphthalene	5.6
U048	2-Chlorophenol	5.7
U050	Chrysene	8.2
U051	Creosote - Lead	0.51 [a]
U051	Creosote - Naphthalene	3.1
U051	Creosote - Pentachlorophenol	7.4
U051	Creosote - Phenanthrene	3.1
U051	Creosote - Pyrene	8.2
U051	Creosote - Toluene	28
U051	Creosote - Xylenes (total)	28

Table 1-3 (Continued)

TREATMENT STANDARDS FOR U AND P NONWASTEWATERS
AND MULTI-SOURCE LEACHATE (F039) INCLUDED IN VOLUME C

Waste Code	Regulated Constituent	Treatment Standard (mg/kg)
U052	Cresol (m- and p- isomers)	3.2
U052	o-Cresol	5.6
U060	o,p'-DDD	0.087
U060	p,p'-DDD	0.087
U061	o,p'-DDD	0.087
U061	p,p'-DDD	0.087
U061	o,p'-DDE	0.087
U061	p,p'-DDE	0.087
U061	o,p'-DDT	0.087
U061	p,p'-DDT	0.087
U063	Dibenz(a,h)anthracene	8.2
U066	1,2-Dibromo-3-chloropropane	15
U067	1,2-Dibromoethane (Ethylene Dibromide)	15
U068	Dibromomethane	15
U070	o-Dichlorobenzene	6.2
U071	m-Dichlorobenzene	6.2
U072	p-Dichlorobenzene	6.2
U075	Dichlorodifluoromethane	7.2
U076	1,1-Dichloroethane	7.2
U077	1,2-Dichloroethane	7.2
U078	1,1-Dichloroethylene	33
U079	trans-1,2-Dichloroethylene	33
U080	Methylene chloride	33
U081	2,4-Dichlorophenol	14
U082	2,6-Dichlorophenol	14
U083	1,2-Dichloropropane	18
U084	cis-1,3-Dichloropropylene	18
U084	trans-1,3-Dichloropropylene	18
U101	2,4-Dimethylphenol	14
U105	2,4-Dinitrotoluene	140
U106	2,6-Dinitrotoluene	28
U108	1,4-Dioxane	170
U111	Di-n-propylnitrosamine	14
U112	Ethyl acetate	33
U117	Ethyl ether	160
U118	Ethyl methacrylate	160
U120	Fluoranthene	8.2
U121	Trichloromonofluoromethane	33
U127	Hexachlorobenzene	37
U128	Hexachlorobutadiene	28
U129	alpha-BHC	0.066
U129	beta-BHC	0.066
U129	delta-BHC	0.066
U129	gamma-BHC (Lindane)	0.066
U130	Hexachlorocyclopentadiene	3.6
U131	Hexachloroethane	28
U137	Indeno(1,2,3-c,d)pyrene	8.2
U138	Iodomethane	65
U140	Isobutyl alcohol	170
U141	Isosafrole	2.6

Table 1-3 (Continued)

TREATMENT STANDARDS FOR U AND P NONWASTEWATERS AND MULTI-SOURCE LEACHATE (F039) INCLUDED IN VOLUME C

Waste Code	Regulated Constituent	Treatment Standard (mg/kg)
U142	Kepone	0.13
U152	Methacrylonitrile	84
U155	Methapyrilene	1.5
U157	3-Methylcholanthrene	15
U158	4,4'-Methylenebis(2-chloroaniline)	35
U159	Methyl ethyl ketone	36
U161	Methyl isobutyl ketone	33
U162	Methyl methacrylate	160
U165	Naphthalene	3.1
U169	Nitrobenzene	14
U170	4-Nitrophenol	29
U172	N-Nitrosodi-n-butylamine	17
U174	N-Nitrosodiethylamine	28
U179	N-Nitrosopiperidine	35
U180	N-Nitrosopyrrolidine	35
U181	5-Nitro-o-toluidine	28
U183	Pentachlorobenzene	37
U185	Pentachloronitrobenzene	4.8
U187	Phenacetin	16
U188	Phenol	6.2
U192	Pronamide	1.5
U196	Pyridine	16
U203	Safrole	22
U207	1,2,4,5-Tetrachlorobenzene	19
U208	1,1,1,2-Tetrachloroethane	42
U209	1,1,2,2-Tetrachloroethane	42
U210	Tetrachloroethylene	5.6
U211	Carbon tetrachloride	5.6
U220	Toluene	28
U225	Tribromomethane (Bromoform)	15
U226	1,1,1-Trichloroethane	5.6
U227	1,1,2-Trichloroethane	5.6
U228	Trichloroethylene	5.6
U239	Xylenes (total)	28
U240	2,4-Dichlorophenoxyacetic acid	10
U243	Hexachloropropene	28
U247	Methoxychlor	0.18

[a] Units for the lead standard are mg/l; analyzed by TCLP extract.

2.0 INDUSTRY AFFECTED AND WASTE CHARACTERIZATION

This section describes the industries affected by the land disposal restrictions for the U and P wastes and multi-source leachate (F039) listed in Table 1-3, the processes generating the wastes, the available characterization data, and the determination of waste treatability groups.

2.1 Industry Affected and Process Description

2.1.1 U and P wastes

U or P wastes consist of a commercial chemical product or manufacturing intermediate from a non-specific source containing any of the chemicals listed in 40 CFR 261.33(e) or (f) and in which the listed chemical is the sole active ingredient. Commercial chemical products or manufacturing intermediates include all commercially pure grades of the listed chemical, all technical grades, and all formulated products in which the listed chemical is the sole active ingredient. In addition, an off-specification product that, if it met specification, would have the generic name included in either 261.33(e) or (f) is a U or P waste. Any residue that is a listed chemical remaining in a container or inner liner removed from a container that will not be recycled, reclaimed, or reused; or any residue or contaminated soil, water, or debris from a spill of such a chemical, is also a U or P waste. However, these wastes do not include manufacturing process wastes. A waste occurs when a product is:

- Discarded or intended to be discarded;
- Mixed with another material and applied to the land for dust suppression or road treatment;
- Applied to land in lieu of its original intended use; or
- Distributed or burned as a fuel or fuel additive.

U wastes are identified as toxic; P wastes are identified as acutely hazardous. Whether a waste is acutely hazardous or toxic generally has no bearing on its treatability.

Industries that generate the wastes listed in Table 1-3 include the organic chemical, pharmaceutical, dye and pigment, textile and fiber, pesticide, and rubber industries; universities; military compounds; and treatment facilities throughout the United States. The Agency estimates that there are approximately 1,200 facilities that may be affected by this rule. The four-digit Standard Industrial Classification (SIC) codes associated with the organic chemicals included in this document include 2869 (Industrial Organic Chemicals, Not Elsewhere Classified), 2879 (Pesticides and Agricultural Chemicals, Not Elsewhere Classified), and 2899 (Chemical and Chemical Preparations, Not Elsewhere Classified). Table A-1 in Appendix A identifies the industrial uses of the commercial chemical products included in Volumes A, B, and C. Table A-2 summarizes the total number of facilities that may generate each waste code. The number of facilities that may generate each waste code are listed by state and by EPA region in Table A-3.

2.1.2 Multi-Source Leachate (F039)

Leachate is defined in 40 CFR 260.10 as any liquid, including any suspended components in the liquid, that has percolated through or drained from hazardous waste. Leachate that is derived from the treatment, storage, or disposal of listed hazardous waste is classified as a hazardous waste by virtue of the "derived-from" rule in 40 CFR 261.3(c)(2). Multi-source leachate (F039) is leachate that is derived from the treatment, storage, or disposal of more than one listed hazardous waste or is leachate generated via contact with more than one hazardous waste. (Leachate that is generated from the treatment, storage, or disposal of only one listed hazardous waste is a single-source leachate subject to the treatment standard established for the waste from which it is derived.)

Multi-source leachate (F039) is most often generated by hazardous waste treatment, storage, and disposal (TSD) facilities, although generators who accumulate more than one hazardous waste on site may also generate multi-source leachate. An example of multi-source leachate is liquid draining into soil from a landfill unit that stores more than one hazardous waste.

2.2 Waste Characterization

Waste characterization data are not currently available for any of the waste codes included in this document. Due to the diversity of methods of waste generation (e.g., off-specification products, spills in soil or water, landfill leachate), the composition of these wastes varies greatly. The constituents of concern in the wastes may be present at concentrations varying from several parts per million to nearly 100% in virtually pure products.

2.3 Determination of Waste Treatability Groups

The wastes included in this document were combined into treatability groups based on similarities in elemental composition and in functional groups present within the chemical structure of each waste. The industries that generate these wastes were also considered in establishing these groups. In most cases, the wastes within each treatability group are believed to be similar in composition and chemical structure, and are therefore expected to be able to be treated to similar levels by an applicable treatment technology.

The wastes were combined into twelve treatability groups:

- Aromatic Wastes;
- Brominated Organic Wastes;
- Halogenated Aliphatic Wastes;
- Halogenated Pesticide and Chlorobenzene Wastes;
- Halogenated Phenolic Wastes;
- Oxygenated Hydrocarbon and Heterocyclic Wastes;
- Wastes of a Pharmaceutical Nature;
- Phenolic Wastes;
- Polynuclear Aromatic Wastes;
- Organo-nitrogen Compound Wastes;
- Miscellaneous Halogenated Organic Wastes; and
- Multi-Source Leachate (F039).

Chemical structures for the waste constituents are presented in Appendix B. Table 2-1 at the end of this section presents, by treatability group, codes that are discussed in this document.

2.3.1 Aromatic Wastes

The waste codes included in this treatability group contain compounds that are classified as aromatics. The structural feature common to all of the compounds in this group is that all of the bonds of these compounds are carbon-carbon and carbon-hydrogen bonds. Compounds in this group have one or more of the following functional groups as part of their structure: an aromatic ring, single carbon-carbon bonds, and double carbon-carbon bonds. The following waste codes are included in this group:

- U019 Benzene;
- U220 Toluene; and
- U239 Xylene(s).

2.3.2 Brominated Organic Wastes

The waste codes included in this treatability group include brominated hydrocarbons. The Agency believes that the presence of bromine in the chemical structure may require modified design and carefully controlled operation of an incineration system. Therefore, the following waste codes have been combined into a separate brominated organics treatability group:

- U029 Bromomethane (Methyl bromide);
- U030 4-Bromophenyl phenyl ether;
- U066 1,2-Dibromo-3-chloropropane;
- U067 1,2-Dibromoethane;
- U068 Dibromomethane; and
- U225 Tribromomethane (Bromoform).

2.3.3 Halogenated Aliphatic Wastes

The waste codes included in this treatability group contain compounds that are classified as halogenated aliphatics. These compounds have common functional groups of single and double carbon-carbon bonds. The compounds in this group also have chlorine atoms substituting for hydrogen atoms in at least one bond of the compound. The following waste codes are included in this group:

•	U044	Chloroform;
•	U076	1,1-Dichloroethane;
•	U077	1,2-Dichloroethane;
•	U078	1,1-Dichloroethylene;
•	U079	trans-1,2-Dichloroethylene;
•	U080	Methylene chloride;
•	U083	1,2-Dichloropropane;
•	U084	1,3-Dichloropropylene;
•	U131	Hexachloroethane;
•	U208	1,1,1,2-Tetrachloroethane;
•	U209	1,1,2,2-Tetrachloroethane;
•	U210	Tetrachloroethylene;
•	U211	Carbon tetrachloride;
•	U226	1,1,1-Trichloroethane;
•	U227	1,1,2-Trichloroethane;
•	U228	Trichloroethylene; and
•	U243	Hexachloropropylene.

2.3.4 Halogenated Pesticide and Chlorobenzene Wastes

The waste codes included in this treatability group include the following general chemical structures (see Appendix B for illustrations): chlorinated nonbornane or nonbornene derivatives; chlorobenzenes; chlorophenoxycarboxylic acid and derivatives; chlorinated diphenyls; and gamma-BHC and hexachlorobutadiene. Most of these wastes are generated in the pesticides and agricultural chemicals industries. The following waste codes are included in this treatability group:

•	P004	Aldrin;
•	P037	Dieldrin;
•	P050	Endosulfan;
•	P051	Endrin;
•	P059	Heptachlor;
•	P060	Isodrin;
•	P123	Toxaphene;
•	U036	Chlordane (alpha and gamma);
•	U037	Chlorobenzene;
•	U060	DDD;
•	U061	DDT;
•	U070	o-Dichlorobenzene;
•	U071	m-Dichlorobenzene;
•	U072	p-Dichlorobenzene;
•	U127	Hexachlorobenzene;

- U128 Hexachlorobutadiene;
- U129 gamma-BHC (Lindane);
- U130 Hexachlorocyclopentadiene
- U142 Kepone;
- U183 Pentachlorobenzene;
- U185 Pentachloronitrobenzene;
- U207 1,2,4,5-Tetrachlorobenzene;
- U240 2,4-Dichlorophenoxyacetic acid; and
- U247 Methoxychlor.

2.3.5 Halogenated Phenolic Wastes

The waste codes included in this treatability group contain compounds that are classified as halogenated phenols. The functional groups common to all of the compounds in this group are an aromatic ring and a carbon-oxygen-hydrogen single bond system. In addition, all of these compounds have at least one chlorine atom attached to the aromatic ring. Based on these similarities in elemental composition and functional groups, the waste codes listed below were grouped together:

- U039 p-Chloro-m-cresol;
- U048 2-Chlorophenol;
- U081 2,4-Dichlorophenol; and
- U082 2,6-Dichlorophenol.

2.3.6 Oxygenated Hydrocarbon and Heterocyclic Wastes

The waste codes included in this treatability group are judged to be structurally similar, based on the presence of oxygen-containing functional groups. These compounds contain at least one oxygen atom integrated into the chemical structure by a single or double bond to a carbon. This group also includes functional groups such as ketones, aldehydes, and alcohols. Accordingly, the following oxygenated hydrocarbon and heterocyclic wastes were combined into one treatability group:

- U002 Acetone;
- U004 Acetophenone;
- U031 n-Butyl alcohol;
- U108 1,4-Dioxane;
- U112 Ethyl acetate;
- U117 Ethyl ether;
- U118 Ethyl methacrylate;

•	U140	Isobutyl alcohol;
•	U159	Methyl ethyl ketone;
•	U161	Methyl isobutyl ketone; and
•	U162	Methyl methacrylate.

2.3.7 Wastes of a Pharmaceutical Nature

Waste codes included in this treatability group are wastes associated with the pharmaceutical industry or wastes that are similar to pharmaceutical wastes. All of the waste constituents included in this group are large, complex, heavily-substituted molecules. Almost all of the waste constituents are aromatic with nitrogen- or sulfur-heterocyclic structures or polynuclear aromatic structures. All of the waste constituents have multiple double bonds and include oxygen, nitrogen, or sulfur atoms. The following waste codes are included in this treatability group:

•	U141	Isosafrole;
•	U155	Methapyrilene;
•	U187	Phenacetin; and
•	U203	Safrole;

2.3.8 Phenolic Wastes

The waste codes included in this treatability group represent compounds that are classified as phenols and nitrophenols. The functional groups common to all of the compounds in this group are an aromatic ring and a carbon-oxygen-hydrogen single bond system. The hydroxyl group is attached directly to the aromatic ring. The nitrophenols also have a nitro group (NO_2) attached directly to the ring. Based on these similarities in elemental composition and functional groups, the waste codes listed below were grouped together:

•	P020	2-sec-Butyl-4-6-dinitrophenol (Dinoseb);
•	P047	4,6-Dinitro-o-cresol;
•	P048	2,4-Dinitrophenol;
•	U052	Cresols (o-, m-, and p- isomers);
•	U101	2,4-Dimethylphenol;
•	U170	4-Nitrophenol; and
•	U188	Phenol.

2.3.9 Polynuclear Aromatic Wastes

The waste codes included in this treatability group represent compounds that are classified as polynuclear aromatics. These compounds contain at least two fused or bridged aromatic rings and have an aromatic ring as the common functional group. The compounds in this group also have several substituents attached to their rings, including amides. In some cases, one of the aromatic carbons may be substituted with another element. The following waste codes are included in this group:

- U005 2-Acetylaminofluorene;
- U018 Benz(a)anthracene;
- U022 Benzo(a)pyrene;
- U050 Chrysene;
- U051 Creosote (naphthalene, pentachlorophenol, phenanthrene, pyrene, toluene, xylene(s), lead);
- U063 Dibenz(a,h)anthracene;
- U120 Fluoranthene;
- U137 Indeno(1,2,3-c,d)pyrene;
- U157 3-Methylcholanthrene; and
- U165 Naphthalene.

2.3.10 Organo-nitrogen Compound Wastes

EPA grouped all remaining non-halogenated wastes containing nitrogen functional groups that were not included in the waste treatability groups described above into the organo-nitrogen compound treatability group. The waste codes in the organo-nitrogen compound treatability group include the following general chemical structures (see Appendix B for illustration): nitrogen heterocyclics; amines and amides; aminated diphenyls and biphenyls; nitriles; nitro compounds; and nitroso compounds. The following waste codes have been combined into this treatability group:

- P077 p-Nitroaniline;
- P101 Ethyl cyanide (Propanenitrile);
- U009 Acrylonitrile;
- U012 Aniline;
- U105 2,4-Dinitrotoluene;
- U106 2,6-Dinitrotoluene;
- U111 Di-n-propylnitrosamine;
- U152 Methacrylonitrile;
- U169 Nitrobenzene;

- U172 N-Nitrosodi-n-butylamine;
- U174 N-Nitrosodiethylamine
- U179 N-Nitrosopiperidine;
- U180 N-Nitrosopyrrolidine;
- U181 5-Nitro-o-toluidine; and
- U196 Pyridine.

2.3.11 Miscellaneous Halogenated Organic Wastes

EPA grouped all remaining halogenated organic wastes that were not included in other waste treatability groups described above into the miscellaneous halogenated organics treatability group. The miscellaneous halogenated organic waste codes include the following general chemical structures (see Appendix B for illustration): chlorinated diphenyls; chlorinated polynuclear aromatics; chlorinated amines, amides, and nitriles; chlorinated methylbenzenes; halogenated aliphatics; halogenated aldehydes, ethers, and esters; and halogenated organosulfur compounds. The following waste codes are included in this group:

- P024 p-Chloroaniline;
- U024 Bis(2-chloroethoxy)methane;
- U025 Bis(2-chloroethyl)ether;
- U027 Bis(2-chloroisopropyl)ether;
- U043 Vinyl chloride;
- U045 Chloromethane;
- U047 2-Chloronaphthalene;
- U075 Dichlorodifluoromethane;
- U121 Trichloromonofluoromethane;
- U138 Iodomethane;
- U158 4,4'-Methylenebis(2-chloroaniline); and
- U192 Pronamide.

2.3.12 Multi-Source Leachate (F039)

The multi-source leachates (F039) included in this document are grouped together for organizational purposes rather than for common treatability characteristics. As noted in Section 2.1.2, they are all generated in a similar fashion. Section 5.0 contains a discussion of the regulated constituents in F039.

TABLE 2-1

TREATABILITY GROUPS FOR NONWASTEWATER FORMS OF ANALYZABLE ORGANIC U AND P WASTES AND MULTI-SOURCE LEACHATE (F039)

AROMATIC WASTES

U019	Benzene
U220	Toluene
U239	Xylenes

BROMINATED ORGANIC WASTES

U029	Bromomethane (Methyl bromide)
U030	4-Bromophenyl phenyl ether
U066	1,2-Dibromo-3-chloropropane
U067	1,2-Dibromoethane
U068	Dibromomethane
U225	Tribromomethane (Bromoform)

HALOGENATED ALIPHATIC WASTES

U044	Chloroform
U076	1,1-Dichloroethane
U077	1,2-Dichloroethane
U078	1,1-Dichloroethylene
U079	trans-1,2-Dichloroethylene
U080	Methylene chloride
U083	1,2-Dichloropropane
U084	1,3-Dichloropropylene
U131	Hexachloroethane
U208	1,1,1,2-Tetrachloroethane
U209	1,1,2,2-Tetrachloroethane
U210	Tetrachloroethylene
U211	Carbon tetrachloride
U226	1,1,1-Trichloroethane
U227	1,1,2-Trichloroethane
U228	Trichlorethylene
U243	Hexachloropropylene

HALOGENATED PESTICIDE AND CHLOROBENZENE WASTES

P004	Aldrin
P037	Dieldrin
P050	Endosulfan
P051	Endrin
P059	Heptachlor
P060	Isodrin
P123	Toxaphene
U036	Chlordane (alpha and gamma)
U037	Chlorobenzene
U060	DDD
U061	DDT
U070	o-Dichlorobenzene
U071	m-Dichlorobenzene
U072	p-Dichlorobenzene

TABLE 2-1 (Continued)

TREATABILITY GROUPS FOR NONWASTEWATER FORMS OF ANALYZABLE ORGANIC U AND P WASTES AND MULTI-SOURCE LEACHATE (F039)

HALOGENATED PESTICIDE AND CHLOROBENZENE WASTES (Continued)

U127	Hexachlorobenzene
U128	Hexachlorobutadiene
U129	gamma-BHC (Lindane)
U130	Hexachlorocyclopentadiene
U142	Kepone
U183	Pentachlorobenzene
U185	Pentachloronitrobenzene
U207	1,2,4,5-Tetrachlorobenzene
U240	2,4-Dichlorophenoxyacetic acid
U247	Methoxychlor

HALOGENATED PHENOLIC WASTES

U039	p-Chloro-m-cresol
U048	2-Chlorophenol
U081	2,4-Dichlorophenol
U082	2,6-Dichlorophenol

OXYGENATED HYDROCARBON AND HETEROCYCLIC WASTES

U002	Acetone
U004	Acetophenone
U031	n-Butyl alcohol
U108	1,4-Dioxane
U112	Ethyl acetate
U117	Ethyl ether
U118	Ethyl methacrylate
U140	Isobutyl alcohol
U159	Methyl ethyl ketone
U161	Methyl isobutyl ketone
U162	Methyl methacrylate

WASTES OF A PHARMACEUTICAL NATURE

U141	Isosafrole
U155	Methapyrilene
U187	Phenacetin
U203	Safrole

PHENOLIC WASTES

P020	2-sec-Butyl-4,6-dinitrophenol (Dinoseb)
P047	4,6-Dinitro-o-cresol
P048	2,4-Dinitrophenol
U052	Cresol
U101	2,4-Dimethylphenol
U170	4-Nitrophenol
U188	Phenol

TABLE 2-1 (Continued)

TREATABILITY GROUPS FOR NONWASTEWATER FORMS OF ANALYZABLE ORGANIC U AND P WASTES AND MULTI-SOURCE LEACHATE (F039)

POLYNUCLEAR AROMATIC WASTES

U005	2-Acetylaminofluorene
U018	Benz(a)anthracene
U022	Benzo(a)pyrene
U050	Chrysene
U051	Creosote
U063	Dibenz(a,h)anthracene
U120	Fluoranthene
U137	Indeno(1,2,3-c,d)pyrene
U157	3-Methylcholanthrene
U165	Naphthalene

ORGANO-NITROGEN COMPOUND WASTES

P077	p-Nitroaniline
P101	Ethyl cyanide (Propanenitrile)
U009	Acrylonitrile
U012	Aniline
U105	2,4-Dinitrotoluene
U106	2,6-Dinitrotoluene
U111	Di-n-propylnitrosamine
U152	Methacrylonitrile
U169	Nitrobenzene
U172	N-Nitrosodi-n-butylamine
U174	N-Nitrosodiethylamine
U179	N-Nitrosopiperidine
U180	N-Nitrosopyrrolidine
U181	5-Nitro-o-toluidine
U196	Pyridine

MISCELLANEOUS HALOGENATED ORGANIC WASTES

P024	p-Chloroaniline
U024	Bis(2-chloroethoxy)methane
U025	Bis(2-chloroethyl)ether
U027	Bis(2-chloroisopropyl)ether
U043	Vinyl chloride
U045	Chloromethane (Methyl chloride)
U047	2-Chloronaphthalene
U075	Dichlorodifluoromethane
U121	Trichloromonofluoromethane
U138	Iodomethane
U158	4,4'-Methylenebis(2-chloroaniline)
U192	Pronamide

F039	MULTI-SOURCE LEACHATE

3.0 IDENTIFICATION OF BEST DEMONSTRATED AND AVAILABLE TECHNOLOGY (BDAT)

This section presents the Agency's rationale for determining the best demonstrated available technology (BDAT) for nonwastewater forms of multi-source leachate (F039) and analyzable organic U and P wastes. BDAT for organic constituents with concentration-based treatment standards is incineration. BDAT for metal constituents with concentration-based treatment standards is stabilization.

This section presents the Agency's determination of:

- Applicable technologies;
- Demonstrated technologies; and
- The best demonstrated available technology (BDAT) for treatment of these wastes.

In determining BDAT, the Agency first determines which technologies are potentially applicable for treatment of the waste(s) of interest. The Agency then determines which of the applicable technologies are demonstrated for treatment of the waste(s) of interest. Next, the Agency determines which of the demonstrated technologies is "best" for the purpose of establishing BDAT. Integral to the determination of BDAT is the evaluation of all available treatment performance data. The treatment performance data that were evaluated to determine BDAT for these wastes are presented in Section 4.0. Finally, the Agency determines whether the best demonstrated technology is available for treatment of the waste(s) of interest.

The U and P wastes and the majority of the regulated constituents in multi-source leachate (F039) included in this document are organic. Therefore, treatment technologies are identified in this section for treatment of hazardous organic constituents. Treatment technologies for metal constituents in U051 and multi-source leachate are also identified in this section.

3.1 Applicable Treatment Technologies

To be applicable, a technology must theoretically be usable to treat the waste. Detailed descriptions of technologies that are applicable to treat listed hazardous wastes are provided in EPA's Treatment Technology Background Document (Reference 3).

3.1.1 Organic Constituents

Since nonwastewater forms of the U and P and multi-source leachate (F039) wastes may contain hazardous organic constituents at treatable concentrations, applicable treatment technologies include those that destroy or reduce the total amount of various organic compounds in the waste. The Agency has identified the following treatment technologies as applicable for these wastes:

- Incineration (fluidized-bed, rotary kiln, and liquid injection);
- Fuel substitution;
- Solvent extraction followed by incineration or recycle of the extract; and
- Critical fluid extraction followed by incineration of the contaminated solvents.

Total recycle or reuse may also be applicable for certain wastes, such as off-specification commercial chemical products. These treatment technologies were identified based on current waste treatment practices and engineering judgment.

Incineration

Incineration is a destruction technology in which energy, as heat, is transferred to the waste to destabilize chemical bonds and destroy hazardous organic constituents. In a fluidized-bed incinerator, waste is injected into the fluidized-bed material (generally sand and/or incinerator ash), where it is heated to its ignition temperature. Heat energy from the combustion reactions is then transferred back to the fluidized bed. Ash is removed periodically during operation and during bed change-outs.

In a rotary kiln incinerator, wastes are fed into the elevated end of the kiln, and the rotation of the kiln mixes the waste with hot gases to heat the waste to its ignition temperature. Ash is removed from the lower end of the kiln. Combustion gases from the kiln enter the afterburner for complete destruction of organic waste constituents. Other wastes may also be injected into the afterburner.

In a liquid injection incinerator, liquid wastes are atomized and injected into the incinerator. In general, only wastes with low or negligible ash contents are amenable to liquid injection incineration. Therefore, this technology generally does not generate an ash residual.

Combustion gases from the incinerator are then fed to a scrubber system for cooling and removal of entrained particulates and acid gases, if present. In general, with the exception of liquid injection incineration, two residuals are generated by incineration processes: ash and scrubber water.

Fuel Substitution

Fuel substitution is a destruction technology in which energy, as heat, is transferred to the waste to destabilize chemical bonds and destroy organic constituents. Fuel substitution differs from incineration in that the waste is used as a fuel in industrial furnaces or boilers. Two residuals may be generated by the fuel substitution process: ash and scrubber water.

Solvent Extraction

Solvent extraction is a separation technology in which organics are removed from the waste due to greater constituent solubility in the solvent phase than in the waste phase. This technology generates two residuals: a treated waste residual and an extract. The extract may be recycled or may be treated by incineration.

Critical Fluid Extraction

Critical fluid extraction is a solvent extraction technology in which the solvent is brought to its critical state (liquified gas) to aid in the extraction of hazardous organic constituents from the wastes. After the extraction step, the solvent is returned to its normal gaseous state, generating a small volume of extract that is concentrated in hazardous organic constituents. This technology generates two residuals: a treated waste residual and an extract. The extract may be recycled or may be treated by incineration.

Total Recycle or Reuse

Total recycle or reuse of a waste in the same process or another process eliminates the generation of the waste and consequently generates no treatment residuals.

3.1.2 Metal Constituents

Since nonwastewater forms of the U and P and multi-source leachate (F039) wastes may contain hazardous metal constituents in treatable concentrations, applicable treatment technologies include those that destroy, immobilize, or reduce the amount of metals in the waste. The Agency has identified the following treatment technologies as applicable for these wastes:

- Stabilization; and
- Acid leaching.

Stabilization

Stabilization refers to a broad class of treatment processes that chemically reduce the mobility of metal constituents in a waste by binding them into a solid material that resists leaching when water or a mild acid solution comes into contact with the waste material. Organic materials are not usually effectively stabilized and may, in fact, inhibit the stabilization of metals. Hence, stabilization is applicable to nonwastewaters only after the organics have been removed by other treatment, such as incineration.

Acid Leaching

Acid leaching is a separation technology used to recover metals from wastes in solid or slurry form. This process is most effective with wastes containing high concentrations of metals that are soluble in a strong acid solution or that can be converted by reaction with a strong acid to a soluble form.

3.2 Demonstrated Treatment Technologies

To be demonstrated, a technology must be employed in full-scale operation for treatment of the waste in question or a similar waste. Technologies available only at pilot- or bench-scale operations are not considered in identifying demonstrated technologies.

3.2.1 Organic Constituents

The Agency has identified incineration as a demonstrated technology for treatment of organic constituents in nonwastewater forms of the U and P and multi-source leachate (F039) wastes. For the land disposal restrictions program, the Agency conducted rotary kiln incineration tests on a full-scale operational basis. The Agency also conducted an ethylene dibromide (EDB) incineration test. The following waste constituents in each treatability group were incinerated in at least one of the incineration tests, as described in Section 4.0:

Aromatic Wastes

U019	Benzene
U220	Toluene
U239	Xylenes

Brominated Organic Wastes

U067	1,2-Dibromoethane (Ethylene dibromide)

Halogenated Aliphatic Wastes

U044	Chloroform
U076	1,1-Dichloroethane
U077	1,2-Dichloroethane
U080	Methylene chloride
U131	Hexachloroethane
U210	Tetrachloroethylene
U211	Carbon tetrachloride
U226	1,1,1-Trichloroethane
U227	1,1,2-Trichloroethane
U228	Trichloroethylene

Halogenated Pesticide and Chlorobenzene Wastes

P059	Heptachlor
U036	Chlordane
U037	Chlorobenzene
U070	o-Dichlorobenzene
U072	p-Dichlorobenzene
U127	Hexachlorobenzene
U128	Hexachlorobutadiene
U130	Hexachlorocyclopentadiene
U183	Pentachlorobenzene
U185	Pentachloronitrobenzene
U207	1,2,4,5-Tetrachlorobenzene
U240	2,4-Dichlorophenoxyacetic acid
U247	Methoxychlor

Halogenated Phenolic Wastes

U081	2,4-Dichlorophenol
U082	2,6-Dichlorophenol

Oxygenated Hydrocarbon and Heterocyclic Wastes

U159	Methyl ethyl ketone
U161	Methyl isobutyl ketone

Wastes of a Pharmaceutical Nature

U141	Isosafrole

Phenolic Wastes

P020	2-sec-Butyl-4,6-dinitrophenol (Dinoseb)
U052	o-Cresol
U052	p-Cresol
U188	Phenol

Polynuclear Aromatic Wastes

U018	Benz(a)anthracene
U022	Benzo(a)pyrene
U050	Chrysene
U051	Creosote
U120	Fluoranthene
U137	Indeno(1,2,3-c,d)pyrene

Organo-nitrogen Compound Wastes

U009	Acrylonitrile
U012	Aniline
U169	Nitrobenzene
U196	Pyridine

Miscellaneous Halogenated Organic Wastes

U025	Bis(2-chloroethyl)ether
U043	Vinyl chloride
U045	Chloromethane (methyl Chloride)
U075	Dichlorodifluoromethane
U192	Pronamide

Multi-Source Leachates

All of the above

The Agency believes that since incineration is demonstrated for treatment of the above waste constituents, treatment is therefore demonstrated for all organic waste constituents within each treatability group. Analytical data and complete discussions of the test methods used are available in the corresponding on-site engineering reports (OERs) for each test. A list of the treatment tests conducted by the Agency as part of the BDAT program, along with references for the corresponding OERs, is provided in Table 4-1.

The Agency is not aware of any facilities that treat by fuel substitution the nonwastewater forms of the wastes included in this document;

therefore, the Agency believes that fuel substitution is not currently demonstrated for these wastes.

The Agency is not aware of any facilities that treat nonwastewater forms of the wastes included in this document, or wastes judged to be similar, on a full-scale operational basis using solvent extraction or critical fluid extraction; therefore, EPA believes that these technologies are not currently demonstrated for these wastes.

The Agency believes that recycling and reuse is applicable for off-specification U and P wastes; however, the Agency is only aware of facilities that do so for various pesticide U and P wastes. Therefore, recycle and reuse is not considered demonstrated for multi-source leachate (F039) or U or P wastes other than some pesticide wastes.

3.2.2 Metal Constituents

The Agency has identified stabilization as a demonstrated technology for treatment of metals in U051 (creosote) nonwastewaters and in multi-source leachate (F039) nonwastewaters. Stabilization has been demonstrated on a full-scale operational basis for wastes similar to these wastes, as discussed in Section 4.0.

The Agency is not aware of any facilities that treat nonwastewater forms of the wastes included in this document, or wastes judged to be similar, on a full-scale operational basis using acid leaching; therefore, EPA believes that this technology is not currently demonstrated for these wastes.

3.3 Identification of Best Demonstrated and Available Technology (BDAT)

EPA determines best demonstrated and available technology (BDAT) based on a thorough review of all the treatment data available on the waste of concern or wastes judged to be similar. The treatment performance data that were evaluated for the U and P and multi-source leachate (F039) wastes are presented in Section 4.0. The treatment performance data are first screened to determine:

- Whether the data represent operation of a well-designed and well-operated treatment system;
- Whether sufficient analytical quality assurance/quality control measures were employed to ensure the accuracy of the data; and
- Whether the appropriate measure of performance was used to assess the performance of the particular treatment technology.

Following the identification of the "best" demonstrated technology, the Agency determines whether the technology is "available." An available treatment technology is one that (1) is not a proprietary or patented process that cannot be purchased or licensed from the proprietor (i.e., it must be commercially available), and (2) substantially diminishes the toxicity of the waste or substantially reduces the likelihood of migration of hazardous constituents from the waste.

3.3.1 Organic Constituents

EPA has identified incineration as demonstrated for organic constituents in nonwastewater forms of the U and P and multi-source leachate (F039) wastes. EPA has data from the incineration of constituents included in each waste treatability group.

All of the incineration data included in Section 4.0 represent BDAT for wastes included in previous rulemakings and therefore have already met the above conditions, with the exceptions of tests 13 and 14, and the ethylene dibromide incineration test. Treatment performance data and design and operating data for tests 13 and 14 and the ethylene dibromide incineration test are included or are referenced in Section 4.0. These treatment systems were well-designed and well-operated, and sufficient analytical quality assurance/quality control measures were employed during the tests. The appropriate measure of performance (total constituent concentration) was used to assess the treatment systems. Therefore, tests 13 and 14 and the ethylene dibromide test meet the above conditions. Thus, incineration is the "best" technology for treating organic nonwastewater forms of these wastes in each treatability group.

Incineration, identified as the "best" technology for these organic wastes, is commercially available. Treatment performance data included in Section 4.0 show substantial treatment by incineration for waste constituents of concern and other similar constituents. Therefore, incineration is "available," and therefore BDAT, for treatment of the organic wastes included in this document.

3.3.2 Metal Constituents

EPA has identified stabilization as demonstrated for metal constituents in nonwastewater forms of the U and P and multi-source leachate (F039) wastes.

All stabilization data presented in Section 4.0 represent "best" for wastes included in previous rulemakings, and therefore have already been determined to meet the conditions described above regarding well-designed and well-operated treatment systems, QA/QC measures, and appropriate measures of performance. In addition, as stabilization is the only technology considered to be demonstrated for the metal constituents, it is also the best demonstrated technology for these wastes. Hence, stabilization is "best" for metal constituents in nonwastewaters.

Stabilization, identified as a "best" technology for the metal constituents, is commercially available. Treatment performance data for stabilization, included or referenced in Section 4.0, show substantial reduction in the mobilization of metals of concern and other similar constituents. Therefore, stabilization is "available," and therefore BDAT, for treatment of the metal waste constituents in this document.

4.0 TREATMENT PERFORMANCE DATA

This section presents the data available to EPA on the performance of treatment technologies that are demonstrated for treatment of nonwastewater forms of the U and P wastes and multi-source leachate (F039) included in this document. Treatment performance data are used elsewhere in this document to determine which technologies represent BDAT (Section 3.3), to select constituents for regulation (Section 5.0), and to develop treatment standards (Section 6.0). In addition to using treatment performance data from full-scale operations, eligible data may include that developed at research facilities or obtained at less than full-scale operations, provided that the technology is demonstrated in full-scale operation for the waste or similar wastes.

In an effort to account for the wide range of physical forms and chemical compositions of nonwastewater forms of organic U and P wastes and multi-source leachate (F039), EPA examined all available BDAT incineration data to develop treatment standards for these wastes. Specifically, the Agency considered treatment performance data from the 14 EPA-conducted incineration tests listed in Table 4-1. (All tables are presented at the end of this section.)

In most cases, for the organic U and P wastes and the corresponding multi-source leachate (F039) constituents, multiple sets of treatment performance data were used to develop treatment standards. In cases where an individual waste constituent of concern was detected in the untreated or treated wastes from one or more treatment tests, data from only those tests were used to develop treatment standards for that constituent. If an individual constituent of concern was not detected in any of the untreated or treated wastes from the 14 incineration tests, the Agency believes that the constituent would be treated by incineration similarly to other constituents in the same treatability group that were detected. Therefore, detection limits achieved for that individual constituent of concern in ash from all the tests were used to develop treatment standards. The methodology used to develop these treatment standards is discussed in more detail in Section 6.0, and the data that were used to develop treatment standards for these wastes are presented in this section.

Treatment performance data, to the extent that they are available to EPA, include the concentrations for a given constituent in the untreated and treated wastes, values of operating parameters measured at the time the waste was treated, and values of relevant design parameters for the treatment technology. Only treatment performance data for the waste constituents of interest are presented in this section. Values of design and operating parameters for each incineration treatment test can be found in the corresponding On-Site Engineering Report for each test (References 4 through 17).

Table 4-2 presents the highest detection limits available for the incinerator ash in all 14 incineration tests for the regulated organic waste constituents included in this document. More than one detection limit for a constituent in the ash from an incineration test may have been reported. To account for the anticipated variability in untreated U and P wastes, the highest detection limit for the constituent was selected and is presented in Table 4-2. Appendix C presents data for waste constituents that were detected in the untreated waste, incinerator ash, or scrubber water in one or more of the 14 incineration tests listed in Table 4-1.

After reviewing treatment performance data from the 14 incineration tests, the Agency determined that the data from Tests 3, 5, and 6 were not suitable for use in developing treatment standards for organic U and P and multi-source leachate (F039) nonwastewaters. Data from Test 3 were not considered because the detection limits were clearly above the average detection limits for the other incineration tests. In addition, the wastes treated in Test 3 did not contain significant concentrations of the constituents of concern. Data from Tests 5 and 6 were not considered because the wastes treated were K024 (a phthalic anhydride waste) and K037 (a disulfoton waste). These wastes represent unique matrices that the Agency does not believe are representative of U and P or multi-source leachate (F039) waste matrices included in this document. Therefore, data from Tests 3, 5, and 6 were not considered further in developing treatment standards.

In general, treatment standards for the organic constituents in U and P wastes and multi-source leachate (F039) were calculated using data for the appropriate constituent or constituents from the remaining 11 incineration tests listed in Table 4-1. The following subsections discuss, by treatability group, waste codes for which data were not available from the incineration tests or for which the data from the incineration tests were not appropriate for use in calculating treatment standards.

4.1 U and P Nonwastewaters

4.1.1 Brominated Organic Wastes

The Agency is aware of several facilities that currently incinerate bromine-containing wastes. Recently, at Rollins Environmental Services, Deer Park, Texas, the Agency incinerated ethylene dibromine wastes that were cancelled pesticides under FIFRA provisions. Excess oxygen conditions had to be carefully controlled to reduce the amount of bromine gas and to increase the amount of hydrogen bromine gas generated by incineration. Hydrogen bromine is readily absorbed by the air pollution control devices (APCDs), while bromine is difficult to remove by APCDs. The Agency believes that control of the undesirable conversion of the bromine-containing waste to bromine gas significantly affects the design and operation of the incineration systems. For these reasons, the Agency does not believe that transfer of treatment performance data from incineration of non-brominated wastes (i.e., from any of the 14 tests listed in Table 4-1) is technically valid for the purpose of developing numerical treatment standards for brominated organic wastes.

Therefore, treatment performance data from the ethylene dibromide incineration test were used to develop treatment standards for U067 (ethylene dibromide) and were transferred to the remaining waste codes in the brominated organics treatability group. Treatment performance data from the ethylene dibromide incineration test for the untreated waste feed and the incinerator ash treatment residual are included in Table 4-3. Design data for the treatment systems used for the ethylene dibromide incineration test are included in Table 4-4.

4.1.2 Halogenated Pesticides and Chlorobenzenes

Treatment performance data for the o,p'-isomers for DDD, DDE, and DDT (U060 and U061) are not available. Therefore, incineration treatment performance data were transferred from the p,p'-isomers, based on structural similarities, the purpose of developing BDAT treatment standards.

The Agency believes that the detection limits available for isodrin (P060) in incinerator ash are too low to be routinely achievable by analytical laboratories. Therefore, the Agency is transferring the treatment performance data for aldrin (P004) to isodrin for the purpose of developing BDAT treatment standards.

4.1.3 Polynuclear Aromatic Wastes

U051 differs from the other wastes in the polynuclear aromatic treatability group in that it is not defined by one chemical or constituent, but by a group of chemicals defined by the generic name "creosote." Creosote is a derivative of coal that contains a wide range of constituents, including cresols, phenols, naphthalene, benz(a)anthracene, benzo(a)pyrene, fluoranthene, chrysene, indeno(1,2,3-c,d)pyrene, acenaphthalene, and lead. The presence of these polynuclear aromatics is the reason that this waste code has been placed in this treatability group.

Treatment performance data for the organic constituents in U051 were obtained from the 11 incineration tests discussed in Section 4.1. Treatment performance data for lead in U051 nonwastewaters were transferred from stabilization of metals in F006. (Section 5.0 discusses selection of regulated constituents.) The treatment performance data for stabilization of F006 is available in the BDAT Background Document for F006 (Reference 20).

4.2 Multi-Source Leachate (F039)

For the majority of the regulated organic constituents in nonwastewater forms of multi-source leachate (F039), the Agency is developing treatment standards based on the incineration performance data used to develop treatment standards for the corresponding U or P waste. For the multi-source leachate constituents that do not correspond to a U or P waste, the Agency is developing treatment standards based on treatment performance data from a variety of sources. The data sources are described in Section 6.0.

Table 4-1

WASTES TESTED BY INCINERATION

Test Number	Waste Code(s) Tested	Technology Used	On-Site Engineering Report Reference(s)	Background Document Reference
1	K001-Pentachlorophenol	Rotary Kiln	4	21
2	K001-Creosote	RotaryKiln	5	21
3	K011, K013, K014	Rotary Kiln	6	NA
4	K019	Rotary Kiln	7	22
5	K024	Rotary Kiln	8	23
6	K037	Rotary Kiln	9	24
7	K048, K051	Fluidized-Bed	10,11	25
8	K087	Rotary Kiln	12	26
9	K101	Rotary Kiln	13	27
10	K102	Rotary Kiln	14	28
11	F024	Rotary Kiln	15	29
12	K015	Liquid Injection	16	30
13	D014, D016, P059[a], U127[a], U192[a]	Rotary Kiln	17	NA
14	U141[a], U028[a], P020[a], U122[a], U226[a], U239[a], U080[a], U220[a], U166[a], U161[a], U188[a]	Rotary Kiln	17	NA

NA - Not applicable.

[a] Commercial chemical products were used in these incineration tests as surrogates for these wastes.

Table 4-2
SUMMARY OF DETECTION LIMITS FOR WASTE CONSTITUENTS
FROM THE FOURTEEN EPA INCINERATION TESTS *

Waste Code	BDAT No.	Constituent	Test No. ** ->	Detection Limit (ppm) 1	2	3	4	5	6	7	8	9	10	11	13	14
AROMATIC WASTES																
U019	4	Benzene		2	10 a	2 a,b	2	2 a,b,c	2	2	0.025 a	0.005	1.5	0.005	0.01	0.01
U220	43	Toluene		2 a	10 a	2 a	2 c	2 a,b,c	2 a	2 a,b	0.025 a,b,c	0.005 a	1.5 a	0.005	0.01 a	0.01 a
U239	215-217	Xylenes		2 a	10 a	2 a	2	2 c	2	2 a,b	0.025 a	0.005	1.5 a	0.005	0.01	0.01
HALOGENATED ALIPHATIC WASTES																
U044	14	Chloroform		2	10	2 c	2 a	2	2	2	0.025	0.005	1.5	0.005	0.01	0.01
U076	22	1,1-Dichloroethane		2	10	2	2 a	2	2	2	0.025	0.005	1.5	0.005	0.01	0.01
U077	23	1,2-Dichloroethane		2	10	2	2 a	2	2	2	0.025	0.005	1.5	0.005 a	0.01	0.01
U078	24	1,1-Dichloroethylene		2	10	2	2	2	2	2	0.025	0.005	1.5	0.005	0.01	0.01
U079	25	trans-1,2-Dichloroethylene		2	10	2	2	2	2	2	0.025	0.005	1.5	0.005	0.01	0.01
U080	38	Methylene chloride		10 c	50	50	10	50	50	10	0.025	0.005	1.5	0.005	0.01 b	0.01 a,b
U083	26	1,2-Dichloropropane		5	10	5	5	5	5	5	0.025	0.005	1.5	0.005 a	0.01	0.01
U084	28	cis-1,3-Dichloropropylene		5	10	5	5	5	5	5	0.025	0.005	1.5	0.005 a	0.01	0.01
U084	27	trans-1,3-Dichloropropylene		5	10	5	5	5	5	5	0.025	0.005	1.5	0.005 a	0.01	0.01
U131	113	Hexachloroethane		0.5	0.11	10	10 a	0.5	0.40	1	1	0.42	1	0.351 a	0.36	0.36
U209	41	1,1,2,2-Tetrachloroethane		2	10	2	2	2 a,b	2 a,c	2	0.025	0.005	1.5	0.005	0.01	0.01
U208	40	1,1,1,2-Tetrachloroethane		2	10	2	2	2	2	2	0.025	0.005	1.5	0.005	0.01	0.01
U210	42	Tetrachloroethylene		2	10	2 a	2 a	2 c	2	2	0.025	0.005	1.5	0.005 a	0.01 a	0.01
U211	7	Carbon tetrachloride		2	10	2	2 a	2	2 a,c	2	0.025	0.005	1.5	0.005	0.01 a,b	0.01
U226	45	1,1,1-Trichloroethane		2	10	2	2 a	2	2	2	0.025	0.005	1.5	0.005	0.01	0.01 a
U227	46	1,1,2-Trichloroethane		2	10	2	2	2	2	2	0.025	0.005	1.5	0.005 a	0.01	0.01
U228	47	Trichloroethylene		2	10	2	2 a	2	2	2	0.025	0.005	1.5	0.005	0.01	0.01
U243	115	Hexachloropropylene		0.5	0.38	10	10	0.5	0.40	1	NR	NR	NR	0.702	0.36	0.36
HALOGENATED PESTICIDE AND CHLOROBENZENE WASTES																
P004	172	Aldrin		NA	0.001	0.0000015	NA	NA	0.001	NA	NA	NA	NA	NA	0.0066	0.0066
P037	181	Dieldrin		NA	0.001	0.0000015	NA	NA	0.001	NA	NA	NA	NA	NA	0.013	0.013
P050	182	Endosulfan I		NA	0.001	0.0000015	NA	NA	0.001	NA	NA	NA	NA	NA	0.0066	0.0066
P050	183	Endosulfan II		NA	0.001	0.0000015	NA	NA	0.001	NA	NA	NA	NA	NA	0.013	0.013
P050	238	Endosulfan sulfate		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.013	0.013
P051	184	Endrin		NA	0.001	0.000015	NA	NA	0.001	NA	NA	NA	NA	NA	0.013	0.013
P051	185	Endrin aldehyde		NA	0.002	0.000003	NA	NA	0.002	NA	NA	NA	NA	NA	0.013	0.013
P059	186	Heptachlor		NA	0.001	0.0000010	NA	NA	0.001	NA	NA	NA	NA	NA	0.0066 a	0.0066
P059	187	Heptachlor epoxide		NA	0.001	0.0000015	NA	NA	0.001	NA	NA	NA	NA	NA	0.0066	0.0066
P060	188	Isodrin		NA	0.001	0.0000015	NA	NA	0.001	NA	NA	NA	NA	NA	NR	NR
P123	191	Toxaphene		NA	0.1	0.0002	NA	NA	0.1	NA	NA	NA	NA	NA	0.13	0.13
U036	177	Chlordane (alpha and gamma)		NA	0.015	0.0002	NA	NA	0.015	NA	NA	NA	NA	NA	0.013 a	0.013
U037	9	Chlorobenzene		2	10	0.002	2 a	2	2	2	0.025	0.005	1.5	0.005	0.010 a	0.010
U060	178	DDD		NA	0.002	0.000003	NA	NA	0.002	NA	NA	NA	NA	NA	0.013	0.013
U061	178	DDD		NA	0.002	0.000003	NA	NA	0.002	NA	NA	NA	NA	NA	0.013	0.013
U061	179	DDE		NA	0.001	0.0000015	NA	NA	0.001	NA	NA	NA	NA	NA	0.013	0.013
U061	180	DDT		NA	0.002	0.000003	NA	NA	0.002	NA	NA	NA	NA	NA	0.013	0.013

Table 4-2 (Continued)
SUMMARY OF DETECTION LIMITS FOR WASTE CONSTITUENTS
FROM THE FOURTEEN EPA INCINERATION TESTS *

Waste Code	BDAT No.	Constituent	Test No.* -> 1	2	3	4	5	6	7	8	9	10	11	13	14
			Detection Limit (ppm)												
HALOGENATED PESTICIDE AND CHLOROBENZENE WASTES (continued)															
U070	87	ortho-Dichlorobenzene	0.5	0.13	0.01	2 a	0.50	0.4	0.2	1	0.42	1	0.351 a	0.36	0.36
U071	86	meta-Dichlorobenzene	0.5	0.13	0.01	2	0.50	0.4	0.2	1	0.42	1	0.351	0.36	0.36
U072	88	para-Dichlorobenzene	0.5	0.29	0.01	2 a	0.50	0.4	0.2	1	0.42	1	0.351 a	0.36	0.36
U127	110	Hexachlorobenzene	0.5	0.13	0.01	10 a	0.5	0.4	1	1	0.42	1	0.351 a	0.36 a	0.36
U128	111	Hexachlorobutadiene	0.5	0.06	0.01	10 a	0.5	0.4	1	1	0.42	1	0.351	0.36 a	0.36
U129	173	alpha-BHC	NA	0.0005	0.0000008	NA	NA	0.0005	NA	NA	NA	NA	NA	0.0066	0.0066
U129	174	beta-BHC	NA	0.001	0.0000015	NA	NA	0.001	NA	NA	NA	NA	NA	0.0066	0.0066
U129	175	delta-BHC	NA	0.001	0.0000015	NA	NA	0.001	NA	NA	NA	NA	NA	0.0066	0.0066
U129	176	gamma-BHC (Lindane)	NA	0.001	0.000001	NA	NA	0.001	NA	NA	NA	NA	NA	0.0066	0.0066
U130	112	Hexachlorocyclopentadiene	0.5	0.4	0.01	10	0.5	0.4	1	1	0.42	1	0.351	0.36 a	0.36
U142	189	Kepone	NA	0.006	NR	NA	NA	0.006	NA	NA	NA	NA	NA	NR	NR
U183	136	Pentachlorobenzene	0.5	0.1	0.01	10 a	0.5	0.4	1	NR	ND	ND	1.76	0.36 a	0.36
U185	138	Pentachloronitrobenzene	5	0.17	0.1	10	5	4	1	10	4.2	1	3.51	0.36 a	0.36
U207	148	1,2,4,5-Tetrachlorobenzene	5	0.1	0.01	5 a	5	0.4	0.5	2	0.84	2	0.702	0.36	0.36
U240	192	2,4-Dichlorophenoxyacetic acid	NA	0.5	0.0005	NA	NA	0.02	NA	NA	NA	NA	NA	0.2 a,b,c	0.2 a,b
U247	190	Methoxychlor	NA	0.003	0.000005	NA	NA	0.003	NA	NA	NA	NA	NA	0.013 a	0.013
HALOGENATED PHENOLIC WASTES															
U039	76	p-Chloro-m-cresol	0.5	0.2	0.01	5	0.5	0.4	0.5	1	0.42	1	0.351	0.36	0.36
U048	78	2-Chlorophenol	0.5	0.22	0.01	2	0.5	0.4	0.2	1	0.42	1	0.351	0.36	0.36
U081	90	2,4-Dichlorophenol	0.5	0.18	0.01	5 a	0.5	0.4	0.5	1	0.42	1	0.351	0.36 a	0.36
U082	91	2,6-Dichlorophenol	0.5	0.46	0.01	5 a	0.5	0.4	0.5	NR	ND	ND	0.702	0.36	0.36
OXYGENATED HYDROCARBON AND HETEROCYCLIC WASTES															
U002	222	Acetone	50	50	0.05 a	10	50	50	10	0.05	0.01 a	3	0.01 a	0.02 a,b	0.02
U004	53	Acetophenone	0.5	0.19	0.01	2	0.5	0.4	0.2	2	0.84	2	1.76	0.36	0.36
U031	223	n-Butyl alcohol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.4	0.4
U108	29	1,4-Dioxane	50	NA	NA	NA	100	NA	NA	1	0.2	60	0.2	0.4	0.4
U112	225	Ethyl acetate	5	10	0.002	NA	2 c	2	NA	NA	NA	NA	NA	0.04	0.04
U117	227	Ethyl ether	50	NA	NA	NA	50	NA	NA	NA	NA	NA	NA	0.01	0.01
U118	31	Ethyl methacrylate	2	50	0.01	2	2	10	2	0.5	0.1	30	0.1	0.01	0.01
U140	33	Isobutyl alcohol	0.2	NA	NA	2	NA	NA	2	1	0.2	60	0.2	1	1
U159	34	Methyl ethyl ketone	10	50	0.05	10 a	10 a,b	50 b	10	0.025 a,c	0.01	3	0.01 a	0.02	0.02
U161	229	Methyl isobutyl ketone	10 a	100	0.01	10	10	10	10	0.025	0.01	3	0.01	0.02	0.02 a
U162	35	Methyl methacrylate	2	50	0.01	2	2	10	2	0.5	0.1	30	0.1	0.01	0.01
WASTES OF A PHARMACEUTICAL NATURE															
U141	117	Isosafrole	5	0.1	0.1	NA	5	4	NA	2	0.84	2	0.702	0.36	0.36 a
U155	118	Methapyrilene	NA	0.8	NA	NA	NA	NA	NA	NR	NA	NA	NA	0.36	0.36
U187	140	Phenacetin	5	NA	0.1	2	5	4	0.2	2	0.84	2	0.702	0.36	0.36
U203	147	Safrole	5	0.17	NA	NA	5	4	NA	5	2.1	5	1.76	0.36	0.36

Table 4-2 (Continued)
SUMMARY OF DETECTION LIMITS FOR WASTE CONSTITUENTS
FROM THE FOURTEEN EPA INCINERATION TESTS *

			Detection Limit (ppm)												
Waste Code	BDAT No.	Constituent	Test No.* ->	1	2	3	4	5	6	7	8	9	10	11	13	14
PHENOLIC WASTES															
P020	73	2-sec-Butyl-4,6-dinitrophenol	NA	NA	NA	NA	NA	NA	NA	5	2.1	5	1.76	0.36	0.36 a
P047	100	4,6-Dinitro-o-cresol and salts	2.5	1.6	0.05	50	2.5	2	5	5	2	5	1.76	1.7	1.7
P048	101	2,4-Dinitrophenol	2.5	2.8	0.05	50	2.5	2	5	5	2	5	1.76	1.7	1.7
U052	81	o-Cresol	0.5	0.67	0.01	2 a	0.5	0.4	0.2	1	0.42	1	0.351	0.36	0.36
U052	82	Cresol (m- and p- isomers)	0.5	0.67	0.01	2	0.5	0.4	0.2	1 a	0.42	1	0.351	0.36	0.36
U101	96	2,4-Dimethyl phenol	0.5	0.18	0.01	5	0.5	0.4	0.5	1	0.42	1	0.351	0.36	0.36
U170	127	4-Nitrophenol	2.5	0.16	0.05	10	2.5	2	1	5	2	5	1.76	1.7	1.7
U188	142	Phenol	0.5	0.1 a	0.01	2 a	0.5	0.4	0.2	1 a	0.42	1 a,c	0.351 a	0.36	0.36 a
POLYNUCLEAR AROMATIC WASTES															
U005	54	2-Acetylaminofluorene	50	0.43	1000	NA	50	40	NA	2.0	0.84	2.0	0.702	0.36	0.36
U018	59	Benz(a)anthracene	0.5 a	0.52 a	10	2.0	0.50	0.40	0.20 a	1.0 a	0.42	1.0	0.351 a	0.36	0.36
U022	62	Benzo(a)pyrene	0.5 a	0.17 a	10	2.0	0.50	0.40	0.20	1.0 a	0.42	1.0	0.351 a	0.36	0.36
U050	80	Chrysene	0.5 a	0.17 a	10	2.0	0.50	0.40	0.20 a	1.0 a	0.42	1.0	0.351 a	0.36	0.36
U063	83	Dibenz(a,h)anthracene	0.5	0.17	10	2.0	0.50	0.40	0.20	1.0	0.42	1.0	0.351	0.36	0.36
U120	108	Fluoranthene	0.5 a	0.15 a	10	2.0	0.50	0.40	0.20	1.0 a	0.42	1.0	0.351	0.36	0.36
U137	116	Indeno(1,2,3-c,d)pyrene	0.5	0.25	10	5.0	0.50	0.40	0.50	1.0 a	0.42	1.0	0.351 a	0.36	0.36
U157	119	3-Methylcholanthrene	5	0.23	100	NA	5.0	4.0	NA	2.0	0.84	2.0	0.702	0.36	0.36
U165	121	Naphthalene	0.5 a	0.11 a	10	2.0 a	0.5	0.4	0.20 a	1.0 a	0.42	1.0	0.351	0.36	0.36
U051	121	Creosote-Naphthalene	0.5 a	0.11 a	10	2.0 a	0.5	0.4	0.20 a	1.0 a	0.42	1.0	0.351	0.36	0.36
U051	139	Creosote-Pentachlorophenol	2.5 a	0.24	50	50	2.5	2.0	5.0	5.0	2.0	5.0	1.76	1.7	1.7
U051	141	Creosote-Phenanthrene	0.5 a	0.36 a	10	2.0 a	0.5	0.4	0.20 a	1.0 a	0.42	1.0	0.351 a	0.36	0.36
U051	145	Creosote-Pyrene	0.5 a	0.13 a	10	2.0	0.5	0.4	0.20 a	1.0 a	0.42	1.0	0.351	0.36	0.36
U051	43	Creosote-Toluene	2 a	10 a	2 a	2 c	2 a,b,c	2 a	2 a,b	0.025 a,b,c	0.005 a	1.5 a	0.005	0.01 a	0.01 a
U051	215-217	Creosote-Xylenes	2 a	10 a	2 a	2	2 c	2	2 a,b	0.025 a	0.005	1.5 a	0.005	0.01	0.01
ORGANO-NITROGEN COMPOUND WASTES															
P077	125	p-Nitroaniline	2.5	3.4	0.05	10	2.5	2	1	5	2	5	1.76	1.7	1.7
P101	30	Ethyl cyanide (Propanenitrile)	0.1	NA	NA	100	NR	NA	100	0.5	0.1	30	0.1	0.01	0.01
U009	3	Acrylonitrile	10	10	0.1 a	10	10	10	10	0.5	0.1	30	0.1	0.1	0.1
U012	56	Aniline	1	0.67	0.02	5 a	1	0.7	0.5	1	0.42	1	0.351	0.36	0.36
U105	102	2,4-Dinitrotoluene	0.5	0.38	0.01	50	0.5	0.4	5	1	0.42	1	0.351	0.36	0.36
U106	103	2,6-Dinitrotoluene	0.5	0.13	0.01	10	0.5	0.4	1	1	0.42	1	0.351	0.36	0.36
U111	105	Di-n-propylnitrosamine	NR	NA	0.01	5	NA	NA	0.5	NA	0.42	1	0.351	0.36	0.36
U152	37	Methacrylonitrile	0.2	NA	NA	10	10	NA	10	0.5	0.1	30	0.1	0.01	0.01
U169	126	Nitrobenzene	0.5	0.13	0.01	5 a	0.5	0.4	0.5	1	0.42	1	0.351	0.36	0.36
U172	128	N-Nitrosodi-n-butylamine	5	0.21	0.1	5	5	4	0.5	NR	NR	NR	0.702	0.36	0.36
U174	129	N-Nitrosodiethylamine	5	0.18	0.1	10	5	4	1	NR	NR	NR	0.351	0.36	0.36
U179	133	N-Nitrosopiperidine	10	0.19	0.2	10	10	7	1	1	0.42	1	0.351	0.36	0.36
U180	134	N-Nitrosopyrrolidine	10	0.28	0.2	10	10	7	1	5	2.1	5	1.76	0.36	0.36
U181	135	5-Nitro-o-toluidine	10	0.17	0.2	NA	10	7	NA	2	0.84	2	0.702	0.36	0.36
U196	39	Pyridine	5 c	NA	NA	NA	NA	NA	2	2	0.4	120	0.4	0.5	0.5

Table 4-2 (Continued)
SUMMARY OF DETECTION LIMITS FOR WASTE CONSTITUENTS
FROM THE FOURTEEN EPA INCINERATION TESTS *

Waste Code	BDAT No.	Constituent	Test No.* ->	Detection Limit (ppm) 1	2	3	4	5	6	7	8	9	10	11	13	14
MISCELLANEOUS HALOGENATED ORGANIC WASTES																
P024	74	p-Chloroaniline		5	0.67	0.01	5	5	0.4	0.5	1	0.42	1	0.351	0.36	0.36
U024	67	Bis(2-chloroethoxy)methane		0.5	0.36	0.01	2	0.5	0.4	0.2	NA	0.42	1	0.351	0.36	0.36
U025	68	Bis(2-chloroethyl)ether		0.5	0.38	0.01	2 a	0.5	0.4	0.2	1	0.42	1	0.351	0.36	0.36
U027	69	Bis(2-chloroisopropyl)ether		0.5	0.38	0.01	2	0.5	0.4	0.2	1	0.42	1	0.351	0.36	0.36
U043	50	Vinyl chloride		2	10	0.01	2	2	10	2	0.05	0.01	3	0.01	0.02	0.02
U045	15	Chloromethane (Methyl chloride)		2	10	0.01	2	2 a	10	2	0.05	0.01	3	0.01	0.02	0.02
U047	77	2-Chloronaphthalene		0.5	0.13	0.01	2	0.5	0.4	0.2	1	0.42	1	0.351	0.36	0.36
U075	21	Dichloromonofluoromethane		2	10	0.002	2	2 b,c	2	2 a	0.050	0.010	3	0.01 b,c	0.02	0.02
U121	48	Trichlorofluoromethane		2	10	0.002	2	2	2	2	0.025	0.005	1.5	0.005	0.01	0.01
U138	32	Iodomethane		2	20	0.002	2	2	2	2	0.25	0.05	15	0.05	0.01	0.01
U158	120	4,4'-Methylenebis(2-chloroaniline)		10	NA	0.2	NA	10	7	NA	2	0.84	2	0.702	0.36	0.36
U192	144	Pronamide		5	0.12	0.1	10	5	4	1	NR	ND	ND	0.702	0.36 a,b	0.36

* Incinerator ash samples were not collected for Test 12.
** Treatment test number is indicated in Table 4-1.
NA = Not Available
NR = Not Reported
a = Detected in untreated waste.
b = Detected in incinerator ash.
c = Detected in scrubber water.

Table 4-3

TREATMENT PERFORMANCE DATA COLLECTED BY EPA FOR ETHYLENE DIBROMIDE (EDB) AT ROLLINS ENVIRONMENTAL SERVICES, INC. (TEXAS) - INCINERATION

		Untreated Waste		Incineration Ash	
BDAT List Constituent	Sample Set No.	Detection Limit (mg/kg)	Concentration of EDB (mg/kg)	Detection Limit (mg/kg)	EDB in Solids Discharge Stream (mg/kg)
1,2-Dibromoethane (Ethylene dibromide)	1	25,000	119,000	5	< 5
	2	25,000	92,000	5	< 5
	3	25,000	102,000	5	< 5

Source: EDB Test Burn Program Emissions Test Results (Reference 18).

Table 4-4

DESIGN PARAMETERS FOR THE INCINERATOR SYSTEM AT ROLLINS ENVIRONMENTAL SERVICES, INC. (TEXAS)

Physical Design Parameter	Value or Description
ROTARY KILN:	
Manufacturer	*
Height	NR
Inside diameter	9.5 feet
Length	32.8 feet
Volume	2,324 cubic feet
Width	NR
Materials of construction:	
Outer shell	1.18-inch steel plate with 9-inch refractory lining.
Front wall	0.59-inch steel plate with castable refractory and refractory brick lining.
LODDBY FURNACE:	
Manufacturer	*
Height	NR
Inside diameter	6.25 feet
Length	14 feet
Volume	429 cubic feet
Width	NR
AFTERBURNER:	
Manufacturer	*
Height	13.5 feet
Inside diameter	NR
Length	49 feet
Volume	8,300 cubic feet
Width	12.5 feet
Materials of construction:	
Outer shell	13-inch refractory bricks supported by stainless steel clips attached to steel beams.
Ceiling	6-inch bricks

NR - Not Reported.

* - This equipment was especially designed for RES(TX), Inc., and therefore does not carry a model number.

Source: Reference 18.

5.0 SELECTION OF REGULATED CONSTITUENTS

This section presents EPA's methodology and rationale for selection of regulated constituents for the U and P and multi-source leachate (F039) wastes included in this document.

5.1 U and P Wastes

Due to the lack of characterization data for the U and P wastes, only the constituents for which the wastes were listed were considered for regulation. Exceptions include the following waste codes: U051, U052, U060, U061, U084, U129, P050, P051, and P059. These exceptions are discussed in greater detail in the following subsections.

The waste constituents selected for regulation in each of the eleven U and P waste treatability groups discussed in this document are summarized in Table 5-1. (All tables are presented at the end of this section.)

5.1.1 U051 - Creosote

U051, from the polynuclear aromatic wastes treatability group, is listed as creosote. Creosote is a derivative of coal that contains a wide range of constituents, including cresols, phenols, naphthalene, benz(a)anthracene, benzo(a)pyrene, fluoranthene, chrysene, indeno(1,2,3-c,d)pyrene, acenaphthalene, and lead. Creosote has been previously regulated in K001. The Agency is selecting the same organic and metal constituents for regulation in nonwastewater forms of U051 as were regulated in nonwastewater forms of K001 in the First Third: naphthalene, pentachlorophenol, phenanthrene, pyrene, toluene, xylenes, and lead.

5.1.2 U052 - Cresols

U052, from the phenolic wastes treatability group, is listed as "cresols (cresylic acid)." Cresylic acid is the name given to a mixture of three isomeric cresols (methyl phenols), in which the meta-cresol predominates. Thus, U052 typically contains various levels of ortho-cresol, meta-cresol, and para-cresol. Current analytical methods cannot distinguish between the meta and para isomers of cresol. Therefore, the Agency is selecting ortho-cresol and a combination of meta- and para-cresol for regulation in U052.

5.1.3 U060 and U061 - DDD and DDT

U060 and U061 are in the halogenated pesticide and chlorobenzene wastes treatability group. DDD and DDT, the compounds for which U060 and U061 were respectively listed, can both exist as one of two isomers: o,p'-DDD or p,p'-DDD; and o,p'-DDT or p,p'-DDT. Each of these isomers can be analyzed by SW-846 Method 8080 for organochlorine pesticides. Therefore, the Agency is selecting both isomers for regulation in U060 and U061. In addition, DDD and DDE are common breakdown products of DDT. Accordingly, the Agency is also selecting the p,p' and o,p' isomers of both DDD and DDE for regulation in U061 wastes.

5.1.4 U084 - 1,3-Dichloropropene

U084, from the halogenated aliphatic wastes treatability group, is listed as 1,3-dichloropropylene. Because of the position of the chlorines in the structure, this alkene can exist as a mixture of two stereoisomers, cis-1,3-dichloropropylene and trans-1,3-dichloropropylene. Both of these isomers can be analyzed using SW-846 methods. Therefore, the Agency is selecting both isomers for regulation in U084.

5.1.5 U129 - gamma-BHC (Lindane)

Lindane (represented by U129 in the halogenated pesticide and chlorobenzene wastes treatability group) is the gamma-isomer of a class of compounds known as hexachlorocyclohexanes and is often referred to as "gamma-BHC." (BHC is an abbreviation for benzene hexachloride, which is a misnomer since benzene is not part of the chemical structure.) Lindane is the most common isomer of hexachlorocyclohexane (BHC). Typical commercial mixtures of

Lindane include the three other BHC isomers, alpha-, beta-, and delta-BHC, at high concentrations. Therefore, the Agency is selecting all four BHC isomers for regulation in U129.

5.1.6 P050 - Endosulfan

P050 is in the halogenated pesticide and chlorobenzene wastes treatability group. Endosulfan, the compound for which P050 was listed as a hazardous waste, commonly exists as a mixture of two isomers: endosulfan I and endosulfan II. Both can be analyzed by SW-846 Method 8080 for organochlorine pesticides. Accordingly, both isomers were selected for regulation in P050. In addition, endosulfan can be converted to endosulfan sulfate in environmental samples. Therefore, the Agency is also selecting endosulfan sulfate for regulation in P050.

5.1.7 P051 - Endrin and Metabolites

P051 is in the halogenated pesticide and chlorobenzene wastes treatability group. The most common metabolite of endrin is endrin aldehyde. The Agency is selecting both endrin and endrin aldehyde for regulation in P051.

5.1.8 P059 - Heptachlor

P059 is in the halogenated pesticide and chlorobenzene wastes treatability group. Heptachlor can be commonly converted to heptachlor epoxide in environmental samples. Therefore, the Agency is selecting both heptachlor and heptachlor epoxide for regulation in P059.

5.2 Multi-Source Leachate (F039)

As discussed in Section 1.0, multi-source leachate (F039) is liquid which percolates through or from listed hazardous waste, including the F, D, K, U, and P wastes. Therefore, the Agency initially considered for regulation all of the constituents that are present in listed hazardous wastes. These constituents include the BDAT List constituents and other hazardous constituents which are not on the BDAT List due to the fact they are unanalyzable or poorly quantified in hazardous waste matrices. Since it is not possible for the Agency to establish concentration-based treatment standards for these nonquantifiable constituents, the Agency generally specifies a method of treatment as the treatment standard for these wastes. By regulating all waste constituents for which concentration-based treatment standards are appropriate, the Agency believes that these constituents will control those constituents for which numerical standards are not appropriate, obviating the need to specify methods of treatment. Specifically, regulated constituents within each treatability group will control other non-regulated constituents within that treatability group. The Agency believes that this is technically valid since structurally similar compounds are likely to be treated by the same treatment technology and to achieve similar treatment performance.

5.2.1 Constituents Selected for Regulation

The Agency selected for regulation in multi-source leachate those U and P waste constituents for which numerical treatment standards were developed. The Agency also selected for regulation those BDAT List constituents which do not have a corresponding U or P waste designation. Exceptions to this general methodology are discussed below. Regulated constituents in multi-source leachate (F039) are listed in Table 5-2.

Metallic U and P Wastes (Arsenic, Selenium, Chromium, Lead, and Mercury)

As discussed in the respective background documents for arsenic, selenium, chromium, lead, and mercury wastes, these waste constituents include metallic compounds such as metallic salts, organometallics, and bimetallic compounds that are not uniquely analyzable. For example, given a mixture of chromium nitrate and chromium sulfate, analytical methods will measure chromium but cannot determine whether it is in the sulfate or nitrate form. Therefore, regulated constituents include the metallic constituent only and not metallic salt, organo metallic, or bimetallic compounds. The Agency believes that the metal serves as a surrogate regulated constituent for these metallic compounds.

All other BDAT List metal constituents are being regulated in multi-source leachate (F039) except beryllium, hexavalent chromium, copper, thallium, vanadium, and zinc as discussed in Section 5.2.2.

Cyanide P Wastes

As discussed in the Best Demonstrated Available Technology (BDAT) Background Document for Cyanide Wastes (Reference 28), these wastes include metallic cyanides, cyanide salts, and hydrogen cyanide that are not uniquely analyzable. For example, analytical methods will measure total cyanide, but will not measure barium cyanide. Therefore, regulated constituents include total cyanide only and not the metallic cyanide, cyanide salts, or hydrogen cyanide compounds. The Agency believes that total cyanide serves as a surrogate regulated constituent for these cyanide compounds.

5.2.2 Constituents Not Selected for Regulation

Waste constituents that were not selected for regulation in multi-source leachate (F039) include:

- Non-analyzable Organic U and P Wastes;
- Incinerable Reactive Organics and Hydrazine Derivatives;
- Incinerable Inorganics;
- Fluorines;
- Recoverable Metallics (including beryllium dust, nickel carbonyl, and osmium tetroxide);
- Thallium and Vanadium U and P Wastes;
- Other BDAT List Metals (including beryllium, hexavalent chromium, copper, and zinc);

- Cyanide Compounds;
- Gases; and
- Organophosphorus Pesticide Wastes.

These waste constituents and their corresponding "controlling" constituents are listed in Table 5-3. As discussed previously, the Agency believes that these waste constituents will be controlled by regulation of other waste constituents. In most instances, controlling constituents include other constituents within the same treatability group/subgroup that are regulated in nonwastewater forms of multi-source leachate (F039). In some cases, none of the constituents in a treatability group/subgroup were regulated in leachate, therefore; "controlling" constituents were transferred from another similar treatability group/subgroup, as indicated in Table 5-3.

Details concerning reasons why numerical treatment standards are not appropriate for the multi-source leachate constituents that are not being regulated are included in Volume B, D, and E of this five volume background document set and in the preamble for the Final Third Third rule.

TABLE 5-1
BDAT LIST CONSTITUENTS SELECTED FOR REGULATION IN NONWASTEWATER FORMS OF ORGANIC U AND P WASTES

AROMATIC WASTES

U019	Benzene
U220	Toluene
U239	Xylenes

BROMINATED ORGANIC WASTES

U029	Bromomethane (Methyl bromide)
U030	4-Bromophenyl phenyl ether
U066	1,2-Dibromo-3-chloropropane
U067	1,2-Dibromoethane (Ethylene dibromide)
U068	Dibromomethane
U225	Tribromomethane (Bromoform)

HALOGENATED ALIPHATIC WASTES

U044	Chloroform
U076	1,1-Dichloroethane
U077	1,2-Dichloroethane
U078	1,1-Dichloroethylene
U079	trans-1,2-Dichloroethylene
U080	Methylene chloride
U083	1,2-Dichloropropane
U084	cis-1,3-Dichloropropylene
U084	trans-1,3-Dichloropropylene
U131	Hexachloroethane
U208	1,1,1,2-Tetrachloroethane
U209	1,1,2,2-Tetrachloroethane
U210	Tetrachloroethylene
U211	Carbon tetrachloride
U226	1,1,1-Trichloroethane
U227	1,1,2-Trichloroethane
U228	Trichlorethylene
U243	Hexachloropropylene

HALOGENATED PESTICIDE AND CHLOROBENZENE WASTES

P004	Aldrin
P037	Dieldrin
P050	Endosulfan I
P050	Endosulfan II
P050	Endosulfan sulfate
P051	Endrin
P051	Endrin aldehyde
P059	Heptachlor
P059	Heptachlor epoxide
P060	Isodrin
P123	Toxaphene

TABLE 5-1 (Continued)
BDAT LIST CONSTITUENTS SELECTED FOR REGULATION IN NONWASTEWATER FORMS OF ORGANIC U AND P WASTES

HALOGENATED PESTICIDE AND CHLOROBENZENE WASTES (Continued)

U036	Chlordane (alpha and gamma isomers)
U037	Chlorobenzene
U060	o,p'-DDD
U060	p,p'-DDD
U061	o,p'-DDD
U061	p,p'-DDD
U061	o,p'-DDE
U061	p,p'-DDE
U061	o,p'-DDT
U061	p,p'-DDT
U070	o-Dichlorobenzene
U071	m-Dichlorobenzene
U072	p-Dichlorobenzene
U127	Hexachlorobenzene
U128	Hexachlorobutadiene
U129	alpha-BHC
U129	beta-BHC
U129	delta-BHC
U129	gamma-BHC (Lindane)
U130	Hexachlorocyclopentadiene
U142	Kepone
U183	Pentachlorobenzene
U185	Pentachloronitrobenzene
U207	1,2,4,5-Tetrachlorobenzene
U240	2,4-Dichlorophenoxyacetic acid
U247	Methoxychlor

HALOGENATED PHENOLIC WASTES

U039	p-Chloro-m-cresol
U048	2-Chlorophenol
U081	2,4-Dichlorophenol
U082	2,6-Dichlorophenol

OXYGENATED HYDROCARBON AND HETEROCYCLIC WASTES

U002	Acetone
U004	Acetophenone
U031	n-Butyl alcohol
U108	1,4-Dioxane
U112	Ethyl acetate
U117	Ethyl ether
U118	Ethyl methacrylate
U140	Isobutyl alcohol
U159	Methyl ethyl ketone
U161	Methyl isobutyl ketone
U162	Methyl methacrylate

TABLE 5-1 (Continued)
BDAT LIST CONSTITUENTS SELECTED FOR REGULATION IN NONWASTEWATER FORMS OF ORGANIC U AND P WASTES

WASTES OF A PHARMACEUTICAL NATURE

U141	Isosafrole
U155	Methapyrilene
U187	Phenacetin
U203	Safrole

PHENOLIC WASTES

P020	2-sec-Butyl-4,6-dinitrophenol (Dinoseb)
P047	4,6-Dinitro-o-cresol
P048	2,4-Dinitrophenol
U052	Cresol (m- and p- isomers)
U052	o-Cresol
U101	2,4-Dimethylphenol
U170	4-Nitrophenol
U188	Phenol

POLYNUCLEAR AROMATIC WASTES

U005	2-Acetylaminofluorene
U018	Benz(a)anthracene
U022	Benzo(a)pyrene
U050	Chrysene
U063	Dibenz(a,h)anthracene
U120	Fluoranthene
U137	Indeno(1,2,3-c,d)pyrene
U157	3-Methylcholanthrene
U165	Naphthalene
U051	Creosote - Lead
	Creosote - Naphthalene
	Creosote - Pentachlorophenol
	Creosote - Phenanthrene
	Creosote - Pyrene
	Creosote - Toluene
	Creosote - Xylenes (total)

ORGANO-NITROGEN COMPOUND WASTES

P077	p-Nitroaniline
P101	Ethyl cyanide (Propanenitrile)
U009	Acrylonitrile
U012	Aniline
U105	2,4-Dinitrotoluene
U106	2,6-Dinitrotoluene
U111	Di-n-propylnitrosamine
U152	Methacrylonitrile
U169	Nitrobenzene

TABLE 5-1 (Continued)
BDAT LIST CONSTITUENTS SELECTED FOR REGULATION IN NONWASTEWATER FORMS OF ORGANIC U AND P WASTES

ORGANO-NITROGEN COMPOUND WASTES (Continued)

U172	N-Nitrosodi-n-butylamine
U174	N-Nitrosodiethylamine
U179	N-Nitrosopiperidine
U180	N-Nitrosopyrrolidine
U181	5-Nitro-o-toluidine
U196	Pyridine

MISCELLANEOUS HALOGENATED ORGANIC WASTES

P024	p-Chloroaniline
U024	Bis(2-chloroethoxy)methane
U025	Bis(2-chloroethyl)ether
U027	Bis(2-chloroisopropyl)ether
U043	Vinyl chloride
U045	Chloromethane (Methyl chloride)
U047	2-Chloronaphthalene
U075	Dichlorodifluoromethane
U121	Trichloromonofluoromethane
U138	Iodomethane
U158	4,4'-Methylenebis(2-chloroaniline)
U192	Pronamide

Table 5-2

REGULATED MULTI-SOURCE LEACHATE (F039) CONSTITUENTS

BDAT List No.	Regulated Organic Constituent
51.	Acenaphthalene
52.	Acenaphthene
222.	Acetone
53.	Acetophenone
54.	2-Acetylaminofluorene
3.	Acrylonitrile
172.	Aldrin
56.	Aniline
57.	Anthracene
200.	Aroclor 1016
201.	Aroclor 1221
202.	Aroclor 1232
203.	Aroclor 1242
204.	Aroclor 1248
205.	Aroclor 1254
206.	Aroclor 1260
173.	alpha-BHC
174.	beta-BHC
175.	delta-BHC
176.	gamma-BHC (Lindane)
59.	Benz(a)anthracene
4.	Benzene
62.	Benzo(a)pyrene
63.	Benzo(b)fluoranthene
64.	Benzo(g,h,i)perylene
65.	Benzo(k)fluoranthene
67.	Bis(2-chloroethoxy)methane
68.	Bis(2-chloroethyl)ether
69.	Bis(2-chloroisopropyl)ether
70.	Bis(2-ethylhexyl)phthalate
5.	Bromodichloromethane
6.	Bromomethane (Methyl bromide)
71.	4-Bromophenyl phenyl ether
223.	n-Butyl alcohol
72.	Butyl benzyl phthalate
73.	2-sec-Butyl-4,6-dinitrophenol (Dinoseb)
7.	Carbon tetrachloride
177.	Chlordane (alpha and gamma)
74.	p-Chloroaniline
9.	Chlorobenzene
11.	Chlorodibromomethane
12.	Chloroethane
14.	Chloroform
76.	p-Chloro-m-cresol
15.	Chloromethane (Methyl chloride)
77.	2-Chloronaphthalene
78.	2-Chlorophenol
16.	3-Chloropropylene
80.	Chrysene
82.	Cresol (m- and p- isomers)
81.	o-Cresol

Table 5-2 (Continued)

REGULATED MULTI-SOURCE LEACHATE (F039) CONSTITUENTS

BDAT List No.	Regulated Organic Constituent
235.	o,p'-DDD
178.	p,p'-DDD
236.	o,p'-DDE
179.	p,p'-DDE
237.	o,p'-DDT
180.	p,p'-DDT
83.	Dibenz(a,h)anthracene
17.	1,2-Dibromo-3-chloropropane
18.	1,2-Dibromoethane (Ethylene dibromide)
19.	Dibromomethane
86.	m-Dichlorobenzene
87.	o-Dichlorobenzene
88.	p-Dichlorobenzene
21.	Dichlorodifluoromethane
22.	1,1-Dichloroethane
23.	1,2-Dichloroethane
24.	1,1-Dichloroethylene
25.	trans-1,2-Dichloroethylene
90.	2,4-Dichlorophenol
91.	2,6-Dichlorophenol
192.	2,4-Dichlorophenoxyacetic acid (2,4-D)
26.	1,2-Dichloropropane
27.	cis-1,3-Dichloropropylene
28.	trans-1,3-Dichloropropylene
181.	Dieldrin
92.	Diethyl phthalate
96.	2,4-Dimethylphenol
97.	Dimethyl phthalate
98.	Di-n-butyl phthalate
99.	1,4-Dinitrobenzene
100.	4,6-Dinitro-o-cresol
101.	2,4-Dinitrophenol
102.	2,4-Dinitrotoluene
103.	2,6-Dinitrotoluene
104.	Di-n-octyl phthalate
105.	Di-n-propylnitrosamine
29.	1,4-Dioxane
195.	Disulfoton
182.	Endosulfan I
183.	Endosulfan II
238.	Endosulfan sulfate
184.	Endrin
185.	Endrin aldehyde
225.	Ethyl acetate
226.	Ethyl benzene
30.	Ethyl cyanide (Propanenitrile)
227.	Ethyl ether
31.	Ethyl methacrylate
196.	Famphur
108.	Fluoranthene

Table 5-2 (Continued)

REGULATED MULTI-SOURCE LEACHATE (F039) CONSTITUENTS

BDAT List No.	Regulated Organic Constituent
109.	Fluorene
186.	Heptachlor
187.	Heptachlor epoxide
110.	Hexachlorobenzene
111.	Hexachlorobutadiene
112.	Hexachlorocyclopentadiene
208.	Hexachlorodibenzofurans
207.	Hexachlorodibenzo-p-dioxins
113.	Hexachloroethane
114.	Hexachloropropylene
116.	Indeno(1,2,3-c,d)pyrene
32.	Iodomethane
33.	Isobutyl alcohol
188.	Isodrin
117.	Isosafrole
189.	Kepone
37.	Methacrylonitrile
118.	Methapyrilene
190.	Methoxychlor
34.	Methyl ethyl ketone
229.	Methyl isobutyl ketone
35.	Methyl methacrylate
197.	Methyl parathion
119.	3-Methylcholanthrene
120.	4,4'-Methylenebis(2-chloroaniline)
38.	Methylene chloride
121.	Naphthalene
125.	p-Nitroaniline
126.	Nitrobenzene
135.	5-Nitro-o-toluidine
127.	4-Nitrophenol
129.	N-Nitrosodiethylamine
128.	N-Nitrosodi-n-butylamine
131.	N-Nitrosomethylethylamine
132.	N-Nitrosomorpholine
133.	N-Nitrosopiperidine
134.	N-Nitrosopyrrolidine
198.	Parathion
136.	Pentachlorobenzene
210.	Pentachlorodibenzofurans
209.	Pentachlorodibenzo-p-dioxins
138.	Pentachloronitrobenzene
139.	Pentachlorophenol
140.	Phenacetin
141.	Phenanthrene
142.	Phenol
199.	Phorate
144.	Pronamide
145.	Pyrene
39.	Pyridine

Table 5-2 (Continued)

REGULATED MULTI-SOURCE LEACHATE (F039) CONSTITUENTS

BDAT List No.	Regulated Organic Constituent
147.	Safrole
193.	Silvex (2,4,5-TP)
148.	1,2,4,5-Tetrachlorobenzene
212.	Tetrachlorodibenzofurans
211.	Tetrachlorodibenzo-p-dioxins
40.	1,1,1,2-Tetrachloroethane
41.	1,1,2,2-Tetrachloroethane
42.	Tetrachloroethylene
149.	2,3,4,6-Tetrachlorophenol
43.	Toluene
191.	Toxaphene
44.	Tribromomethane (Bromoform)
150.	1,2,4-Trichlorobenzene
45.	1,1,1-Trichloroethane
46.	1,1,2-Trichloroethane
47.	Trichloroethylene
48.	Trichloromonofluoromethane
151.	2,4,5-Trichlorophenol
152.	2,4,6-Trichlorophenol
194.	2,4,5-Trichlorophenoxyacetic acid (2,4,5-T)
49.	1,2,3-Trichloropropane
231.	1,1,2-Trichloro-1,2,2-trifluoroethane
50.	Vinyl chloride
215.-217.	Xylenes (total)

BDAT List No.	Regulated Inorganic Constituent
169.	Cyanides (total)

BDAT List No.	Regulated Metal Constituent
154.	Antimony
155.	Arsenic
156.	Barium
158.	Cadmium
159.	Chromium (total)
161.	Lead
162.	Mercury
163.	Nickel
164.	Selenium
165.	Silver

Table 5-3

NONWASTEWATER CONSTITUENTS NOT REGULATED IN MULTI-SOURCE LEACHATE (F039) AND REGULATED CONSTITUENTS THAT CONTROL THEIR TREATMENT

Constituents Not Regulated		"Controlling" Constituent(s)	
Waste Code	Constituent	Waste Code	Constituent
	AMIDES AND AMINES:		
P046	alpha,alpha-Dimethylphenethylamine	U012	Aniline
P064	Isocyanic acid, methyl ester		
U007	Acrylamide		
U092	Dimethylamine		
U110	Dipropylamine		
U167	1-Naphthylamine		
U168	2-Naphthylamine (a)		
U194	n-Propylamine		
U238	Ethyl carbamate		
U223	Toluenediamine		
	AMINATED DIPHENYLS/BIPHENYLS:		
U014	Auramine	Transfer from amides and amines	
U021	Benzidine		
U091	3,3'-Dimethoxybenzidine		
U093	p-Dimethylaminoazobenzene (a,*)		
U095	3,3'-Dimethylbenzidine		
U236	Trypan blue		
	4-Aminobiphenyl		
	Diphenylamine/ diphenylnitrosamine		
	AROMATIC AND OTHER HYDROCARBON WASTES:		
U055	Cumene	U019	Benzene
U056	Cyclohexane	U220	Toluene
U186	1,3-Pentadiene	U239	Xylenes
	BROMINATED ORGANIC WASTES:		
P017	Bromoacetone	U029	Bromomethane
		U030	4-Bromophenyl phenyl ether
		U066	1,2-Dibromo-3-chloropropane
		U067	1,2-Dibromoethane (Ethylene dibromide)
		U068	Dibromomethane
		U225	Bromoform

Table 5-3 (Continued)

NONWASTEWATER CONSTITUENTS NOT REGULATED IN MULTI-SOURCE LEACHATE (F039)
AND REGULATED CONSTITUENTS THAT CONTROL THEIR TREATMENT

Constituents Not Regulated		"Controlling" Constituent(s)	
Waste Code	Constituent	Waste Code	Constituent
	CHLORINATED ALIPHATIC WASTES:		
U074	cis-1,4-Dichloro-2-butene	U044	Chloroform
U074	trans-1,4-Dichloro-2-butene	U076	1,1-Dichloroethane
U184	Pentachloroethane	U077	1,2-Dichloroethane
	2-Chloro-1,3-butadiene	U078	1,1-Dichloroethylene
		U079	1,2-Dichloroethylene (trans isomer)
		U080	Methylene chloride
		U083	1,2-Dichloropropane
		U084	1,3-Dichloropropylene (cis & trans)
		U131	Hexachloroethane
		U208	1,1,1,2-Tetrachloroethane
		U209	1,1,2,2-Tetrachloroethane
		U210	Tetrachloroethylene
		U211	Carbon tetrachloride
		U226	1,1,1-Trichloroethane
		U227	1,1,2-Trichloroethane
		U228	Trichloroethylene
		U243	Hexachloropropylene
	CHLORINATED AMIDES AND AMINES:		
P057	Fluoroacetamide	P024	p-Chloroaniline
U049	4-Chloro-o-toluidine hydrochloride	U192	Pronamide
U097	Dimethylcarbamoyl chloride		
U222	o-Toluidine hydrochloride		
	CHLORINATED DIPHENYLS:		
U073	3,3'-Dichlorobenzidine	U158	4,4-Methylenebis(2-chloroaniline)
	CHLORINATED DIPHENYLS (PESTICIDES):		
U038	Chlorobenzilate (a)	U060	DDD (o,p'- and p,p'- isomers)
U132	Hexachlorophene	U061	DDD (o,p'- and p,p'- isomers)
		U061	DDE (o,p'- and p,p'- isomers)
		U061	DDT (o,p'- and p,p'- isomers)
		U247	Methoxychlor

Table 5-3 (Continued)

NONWASTEWATER CONSTITUENTS NOT REGULATED IN MULTI-SOURCE LEACHATE (F039) AND REGULATED CONSTITUENTS THAT CONTROL THEIR TREATMENT

Constituents Not Regulated		"Controlling" Constituent(s)	
Waste Code	Constituent	Waste Code	Constituent
	CHLORINATED METHYLBENZENES:		
P028	Benzyl chloride		Transfer from chlorinated polynuclear aromatics
U017	Benzal chloride (a)		
	CHLORINATED POLYNUCLEAR AROMATICS:		
U026	Chlornaphazine	U047	2-Chloronaphthalene
	CHLORINATED ORGANOSULFURS:		
P026	1-(o-Chlorophenyl)thiourea		Transfer from halogenated aliphatic wastes and aromatic wastes
P118	Trichloromethanethiol		
U020	Benzene sulfonyl chloride		
U062	Diallate		
	CHLOROPHENOXYACETIC ACID AND DERIVATIVES:		
U240	2,4-D salts	U240	2,4-D
	CYANIDE COMPOUNDS:		
P031	Cyanogen		Cyanide (total)
P033	Cyanogen chloride		
U246	Cyanogen bromide		
U223	Toluene diisocyanate		
	Cyanide (amenable)		
	Sulfide		
	FLUORINES:		
U134	Hydrofluoric acid		Transfer cyanide compounds
P056	Fluorine		
	Fluoride		
	GASES:		
U115	Ethylene oxide		Transfer oxygenated wastes
P076	Nitric oxide		
P078	Nitrogen dioxide		

Table 5-3 (Continued)

NONWASTEWATER CONSTITUENTS NOT REGULATED IN MULTI-SOURCE LEACHATE (F039)
AND REGULATED CONSTITUENTS THAT CONTROL THEIR TREATMENT

Constituents Not Regulated		"Controlling" Constituent(s)	
Waste Code	Constituent	Waste Code	Constituent
HALOGENATED ALDEHYDES, ETHERS, AND ESTERS:			
P016	Bis(chloromethyl)ether	U024	Bis(2-chloroethoxy)methane
P023	Chloroacetaldehyde	U025	Dichloroethyl ether
P058	Fluoroacetic acid, sodium salt	U027	Bis(2-chloroisopropyl) ether
P095	Phosgene		
U006	Acetyl chloride		
U033	Carbonyl fluoride		
U034	Trichloroacetaldehyde		
U041	1-Chloro-2,3-epoxypropane		
U042	2-Chloroethyl vinyl ether		
U046	Chloromethyl methyl ether		
U156	Methyl chlorocarbonate		
HALOGENATED ALIPHATICS:			
P027	3-Chloropropionitrile	U043	Vinyl chloride
		U045	Chloromethane
		U075	Dichlorodifluoromethane
		U121	Trichloromonofluoromethane
		U138	Iodomethane
INCINERABLE INORGANICS:			
P096	Phosphine	Transfer cyanide compounds	
P105	Sodium azide		
U189	Phosphorus sulfide		
U249	Zinc phosphide (<10%)		
P006	Aluminum phosphide		
P122	Zinc phosphide (>10%)		
U135	Hydrogen sulfide		
INCINERABLE REACTIVE ORGANICS AND HYDRAZINE DERIVATIVES:			
U096	alpha,alpha-Dimethyl benzyl hydroperoxide	Transfer from amides and amines	
U109	1,2-Diphenylhydrazine		
P009	Ammonium picrate		
P081	Nitroglycerin		
U133	Hydrazine		
U086	N,N-Diethylhydrazine		
U160	Methyl ethyl ketone peroxide		
P068	Methyl hydrazine		
P112	Tetranitromethane		
U023	Benzotrichloride		
U098	1,1-Dimethylhydrazine		
U099	1,2-Dimethylhydrazine		
U103	Dimethyl sulfate		

Table 5-3 (Continued)

NONWASTEWATER CONSTITUENTS NOT REGULATED IN MULTI-SOURCE LEACHATE (F039)
AND REGULATED CONSTITUENTS THAT CONTROL THEIR TREATMENT

Constituents Not Regulated		"Controlling" Constituent(s)	
Waste Code	Constituent	Waste Code	Constituent
	NITRILES:		
P069	Methyllactonitrile	P101	Ethyl cyanide (Propanenitrile)
U003	Acetonitrile (a)	U009	Acrylonitrile
U149	Malononitrile	U152	Methacrylonitrile
	NITROGEN HETEROCYCLIC COMPOUNDS:		
P008	4-Aminopyridine	U179	N-Nitrosopiperidine
P018	Brucine	U180	N-Nitrosopyrrolidine
P054	Aziridine	U196	Pyridine
P067	2-Methylaziridine		
U011	Amitrole		
U148	Maleic hydrazide		
U191	2-Picoline		
	NITRO COMPOUNDS:		
U171	2-Nitropropane	P077	p-Nitroaniline
U234	sym-Trinitrobenzene	U105	2,4-Dinitrotoluene
		U106	2,6-Dinitrotoluene
		U169	Nitrobenzene
		U181	5-Nitro-o-toluidine
	NITROSO COMPOUNDS:		
P082	N-Nitrosodimethylamine	U111	Di-n-propylnitrosamine
P084	N-Nitrosomethylvinylamine	U172	N-Nitrosodi-n-butylamine
U173	N-Nitrosodiethanolamine	U174	N-Nitrosodiethylamine
U176	N-Nitroso-N-ethylurea		
U177	N-Nitroso-N-methylurea		
U178	N-Nitroso-N-methylurethane		

Table 5-3 (Continued)

NONWASTEWATER CONSTITUENTS NOT REGULATED IN MULTI-SOURCE LEACHATE (F039) AND REGULATED CONSTITUENTS THAT CONTROL THEIR TREATMENT

Constituents Not Regulated		"Controlling" Constituent(s)	
Waste Code	Constituent	Waste Code	Constituent
ORGANO-PHOSPHORUS PESTICIDE WASTES:			
P040	Diethyl 2-pyrazinyl phosphorothioate	P039	Disulfoton
		P071	Methyl parathion
P041	Diethyl-p-nitrophenylphosphate	P089	Parathion
P043	Diisopropylfluorophosphate	P094	Phorate
P044	Dimethoate	P097	Famphur
P062	Hexaethyl tetraphosphate		
P085	Octamethyl pyrophosphoramide		
P109	Tetraethyl dithiopyrophosphate		
P111	Tetraethyl pyrophosphate		
U058	Cyclophosphamide		
U087	O,O-Diethyl S-methyl dithiophosphate		
U235	Tris(2,3-dibromopropyl) phosphate		
ORGANO-SULFUR COMPOUND WASTES:			
P002	1-Acetyl-2-thiourea	Transfer from halogenated aliphatic wastes and aromatic wastes	
P014	Thiophenol (Benzenethiol)		
P022	Carbon disulfide		
P045	Thiofanox		
P049	2,4-Dithiobiuret		
P066	Methomyl		
P070	Aldicarb		
P072	1-Naphthyl-2-thiourea		
P093	N-Phenylthiourea		
P116	Thiosemicarbazide		
U114	Ethylene bis-dithiocarbamic acid		
U116	Ethylene thiourea		
U119	Ethyl methanesulfonate		
U153	Methanethiol		
U193	1,3-Propane sultone		
U218	Thioacetamide		
U219	Thiourea		
U244	Thiram		
	Aramite		
	Benzenethiol		
	Methyl methanesulfonate		

Table 5-3 (Continued)

NONWASTEWATER CONSTITUENTS NOT REGULATED IN MULTI-SOURCE LEACHATE (F039) AND REGULATED CONSTITUENTS THAT CONTROL THEIR TREATMENT

Constituents Not Regulated		"Controlling" Constituent(s)	
Waste Code	Constituent	Waste Code	Constituent
	OXYGENATED HYDROCARBON AND HETEROCYCLIC WASTES:		
P001	Warfarin (>0.3%)	U002	Acetone
P003	Acrolein	U004	Acetophenone
P005	Allyl alcohol	U031	n-Butyl alcohol
P088	Endothall	U108	1,4-Dioxane
P102	Propargyl alcohol	U112	Ethyl acetate
U001	Acetaldehyde	U117	Ethyl ether
U008	Acrylic acid	U118	Ethyl methacrylate
U053	Crotonaldehyde	U140	Isobutyl alcohol
U057	Cyclohexanone (a)	U159	Methyl ethyl ketone
U085	1,2:3,4-Diepoxybutane	U161	Methyl isobutyl ketone
U113	Ethyl acrylate	U162	Methyl methacrylate
U122	Formaldehyde		
U123	Formic acid		
U124	Furan		
U125	Furfural		
U126	Glycidylaldehyde		
U147	Maleic anhydride		
U154	Methanol		
U166	1,4-Naphthoquinone		
U182	Paraldehyde		
U190	Phthalic anhydride		
U197	p-Benzoquinone		
U213	Tetrahydrofuran		
U248	Warfarin ($\leq$0.3%)		
	WASTES OF A PHARMACEUTICAL NATURE:		
P007	5-Aminomethyl-3-isoxazolol	U141	Isosafrole
P042	Epinephrine	U155	Methapyrilene
P075	Nicotine and salts	U187	Phenacetin
P108	Strychnine and salts	U203	Safrole
U010	Mitomycin C		
U015	Azaserine		
U035	Chlorambucil		
U059	Daunomycin		
U089	Diethylstilbestrol		
U090	Dihydrosafrole		
U143	Lasiocarpine		
U150	Melphalan		
U163	N-Methyl-N-nitro-N-nitrosoguanidine		
U164	Methylthiouracil		
U200	Reserpine		
U202	Saccharin and salts		
U206	Streptozotocin		
U237	Uracil mustard		

Table 5-3 (Continued)

NONWASTEWATER CONSTITUENTS NOT REGULATED IN MULTI-SOURCE LEACHATE (F039) AND REGULATED CONSTITUENTS THAT CONTROL THEIR TREATMENT

Constituents Not Regulated		"Controlling" Constituent(s)	
Waste Code	Constituent	Waste Code	Constituent
	PHENOLIC WASTES:		
P034	2-Cyclohexyl-4,6-dinitrophenol	P020	2-sec-Butyl-4,6-dinitrophenol (Dinoseb)
P047	4,6-Dinitro-o-cresol salts	P047	4,6-Dinitro-o-cresol
U201	Resorcinol	P048	2,4-Dinitrophenol
		U052	Cresol (o-, m-, and p- isomers)
		U101	2,4-Dimethylphenol
		U170	4-Nitrophenol
		U188	Phenol
	POLYNUCLEAR AROMATIC WASTES:		
U016	Benz(c)acridine	U005	2-Acetylaminofluorene
U064	1,2,7,8-Dibenzopyrene (Dibenzo(a,i)pyrene)	U018	Benz(a)anthracene
U094	7,12-Dimethyl benz(a)-anthracene	U022	Benzo(a)pyrene
	Dibenzo(a,e)pyrene	U050	Chrysene
		U051	Creosote
		U063	Dibenz(a,h)anthracene
		U120	Fluoranthene
		U137	Indeno(1,2,3-c,d)pyrene
		U157	3-Methylcholanthrene
		U165	Naphthalene
	RECOVERABLE METALLICS:		
P015	Beryllium dust		Antimony
P073	Nickel carbonyl		Arsenic
P087	Osmium tetroxide		Barium
			Cadmium
			Chromium (total)
			Lead
			Mercury
			Nickel
			Selenium
			Silver
	THALLIUM:		
P113	Thallic oxide		Antimony
P114	Thallium selenite		Arsenic
P115	Thallium (I) sulfate		Barium
U214	Thallium (I) acetate		Cadmium
U215	Thallium (I) carbonate		Chromium (total)
U216	Thallium (I) chloride		Lead
U217	Thallium (I) nitrate		Mercury
			Nickel
			Selenium
			Silver

Table 5-3 (Continued)

NONWASTEWATER CONSTITUENTS NOT REGULATED IN MULTI-SOURCE LEACHATE (F039) AND REGULATED CONSTITUENTS THAT CONTROL THEIR TREATMENT

Constituents Not Regulated		"Controlling" Constituent(s)	
Waste Code	Constituent	Waste Code	Constituent
	VANADIUM:		
P119	Ammonium vanadate		Antimony
P120	Vanadium pentoxide		Arsenic
			Barium
			Cadmium
			Chromium (total)
			Lead
			Mercury
			Nickel
			Selenium
			Silver
	OTHER BDAT LIST METALS:		
	Beryllium		Antimony
	Chromium (hexavalent)		Arsenic
	Copper		Barium
	Zinc		Cadmium
			Chromium (total)
			Lead
			Mercury
			Nickel
			Selenium
			Silver

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a: Constituent for which a method of treatment is being promulgated for nonwasterwaters based on the Interlaboratory Ash Study. May not be applicable to wastewaters.

*: Has # std for wastewater and method std for nonwastewater (based on ash study). May not be applicable for wastewaters.

6.0 CALCULATION OF BDAT TREATMENT STANDARDS

The Agency bases numerical treatment standards for regulated constituents on the performance of well-designed and well-operated BDAT treatment systems. These standards account for analytical limitations in available treatment performance data and for variabilities related to treatment, sampling, and analytical techniques and procedures. This section presents the treatment standards calculated for the constituents selected for regulation in Section 5.0 using the available performance data discussed in Section 4.0.

6.1 Treatment Standard Calculation Methodology for U and P Wastes

Treatment standards for U and P wastes amenable to quantification in hazardous waste matrices were calculated based on data compiled from the BDAT incineration database for incinerator ash and scrubber water. Specifically, the Agency considered treatment performance data from 11 of the 14 incineration tests listed in Table 4-1. As discussed in Section 4.0, data from Tests 3, 5, and 6 were not used in calculating treatment standards for the U and P wastes.

The Agency considered the detection limits from all 11 tests and determined which were the most representative for each U and P waste constituent. As described below, to account for the anticipated variability in untreated U and P wastes, the Agency usually selected the highest detection limit for each constituent from the 11 incineration tests.

For each U and P waste code included in this document, the Agency first determined whether the waste constituent of concern was detected in the untreated or treated wastes included in any of the 11 treatment tests. For each treatability group, treatment performance data for waste constituents that were detected in one or more of the 11 treatment tests are included in Appendix C. Table 4-2 presents detection limits for these waste constituents in the 11 treatment tests. Detection limits for waste constituents that were not quantified above detection limits in the untreated or treated wastes from any of the 11 treatment tests are also summarized in Table 4-2.

For a waste constituent that was detected in the untreated waste, a treatment standard was developed based on the highest detection limit for that constituent in ash from those tests in which the waste constituent was detected. If a constituent was detected in either of the treatment residuals (ash or scrubber water), but not in the untreated waste, the Agency feels there is reason to believe that the constituent was actually present in the untreated waste. Therefore, the treatment standard for the constituent was developed based on the highest detection limit for that constituent in ash from those tests in which the waste constituent was detected. For a waste constituent that was not detected in any of the untreated or treated wastes in the 11 treatment tests, the Agency developed a treatment standard based on the highest detection limit for that constituent in the ash in all 11 treatment tests.

Numerical treatment standards for waste constituents selected for regulation in Section 5.0 were calculated by first multiplying the constituent detection limit in ash by an accuracy correction factor and then multiplying the result by a variability factor. The following sections discuss these three components of the treatment standard calculations. These calculations are summarized in Tables 6-1 and 6-2 (all tables are at the end of this section).

6.1.1 Detection Limits

Detection limits (presented in Section 4.0) for the ash residuals were used to calculate treatment standards for nonwastewater forms of these wastes. In cases where the waste constituent was detected in more than one incineration test, the highest detection limit for that constituent in the ash in those tests was used. For example, 1,2-dichloroethane (U077) was detected in two treatment tests (4 and 11), as indicated in Table C-1. The highest detection limit for the ash samples was 2 ppm in Test 4. Therefore, 2 ppm is shown in Table 6-1 as the detection limit for 1,2-dichloroethane and was used to calculate the applicable nonwastewater treatment standard.

For each waste constituent not detected in the untreated or treated wastes in any of the 11 tests, the highest detection limit reported for that constituent in ash in the 11 treatment tests was used. For example, isobutyl alcohol (U140) was not detected in any of the 11 treatment tests and, therefore, does not appear on Table C-1. Detection limits for this constituent in ash ranged from 0.2 ppm to 60 ppm, as indicated in Table 4-2. Therefore, the detection limit of 60 ppm from Test 10 is shown in Table 6-1 as the detection limit for isobutyl alcohol and was used to calculate the applicable nonwastewater treatment standard.

Exceptions to this general methodology are noted in the treatability group discussions in Section 6.2.

6.1.2 Accuracy Correction Factors

The detection limits used to calculate treatment standards were corrected using matrix spike recovery data from the same test from which the detection limits were taken in order to account for analytical interferences associated with the chemical matrices of the samples. Detection limits were corrected for accuracy as follows:

- A matrix spike recovery was determined for each waste constituent. In cases where a matrix spike was not performed for a waste constituent in the treatment test from which the detection limit was taken, the matrix spike recovery from a similar constituent from that treatment test was transferred to the constituent. The source of recovery data used for each constituent is indicated on Table 6-1.
- An accuracy correction factor was determined for each of the above constituents by dividing 100 by the matrix spike recovery (percent) for that constituent.
- Detection limits for each of the waste constituents were corrected by multiplying the detection limit for each constituent by its corresponding accuracy correction factor. The detection limit and accuracy correction factor for each constituent are shown on Table 6-1.

Matrix spike recoveries used to adjust detection limits for the 11 incineration tests are included in Appendix D. Duplicate matrix spikes were performed for some waste constituents. If a duplicate matrix spike was performed for a constituent, the matrix spike recovery used for that constituent was the lower of the two values from the first matrix spike and the duplicate spike. Matrix spike recoveries of less than 20% are not acceptable and were not used to correct detection limits. Matrix spike recoveries greater than 100% were considered to be 100% for the purpose of this calculation so that the data were not adjusted to concentrations below the detection limits. In cases where the detection limit came from more than one test, the lowest matrix spike recovery among the tests was used. For example, the highest detection limit for p-chloroaniline (P024) was 5 ppm in Tests 1 and 4. No matrix spike was performed for p-chloroaniline in Tests 1 or 4. Therefore, the matrix spike recovery data for a similar constituent, 4-nitrophenol from Tests 1 and 4 were used to determine the accuracy correction factor for p-chloroaniline. The lowest matrix spike recovery for 4-nitrophenol from Tests 1 and 4 was 90% in Test 1. Therefore, 90% was entered onto Table 6-1 as the recovery for p-chloroaniline and was used to calculate the accuracy correction factor. Using the lowest recovery available resulted in the highest accuracy correction factor. The tests from which matrix spike recoveries were used are indicated in Table 6-1.

The specific methods used to determine the accuracy correction factors for each of the waste constituents are discussed in the treatability group subsections in Section 6.2.

6.1.3 Variability Factors

The variability factor accounts for the variability inherent in treatment system performance, treatment residual collection, and analysis of the treated waste samples. Variability factors could not be calculated for waste constituents that were not detected in the incinerator ash residuals. In these cases, a variability factor of 2.8 was used to account for this inherent variability, as discussed in the Methodology for Developing Treatment Standards (Reference 2). If a constituent was detected in the ash, then a variability factor could be calculated. The only constituent for which a variability factor could be calculated was 2,4-Dichlorophenoxyacetic acid

(U240). 2,4-D was detected in the ash from Test 13 and a variability factor was calculated for this constituent. The variability factor calculation is included in Appendix E. The variability factors used to calculate the treatment standards for each waste constituent are included in Tables 6-1 and 6-2.

6.2 Detailed Discussion of Organic U and P Waste Treatment Standard Calculations

6.2.1 Aromatic Wastes

All treatment standards for waste constituents included in the aromatic wastes treatability group were calculated according to the methodology described above and are presented in Table 6-1.

6.2.2 Brominated Organic Wastes

Treatment performance data from the Agency's ethylene dibromide incineration test were used to calculate BDAT treatment standards for nonwastewater forms of the brominated organic wastes, as discussed in Section 4.1.3. The treatment standards calculated for these wastes are included in Table 6-2.

6.2.3 Halogenated Aliphatic Wastes

With the exceptions of 1,2-dichloropropane; cis-1,3-dichloropropylene; trans-1,3-dichloropropylene; and 1,1,2-trichloroethane; all treatment standards for waste constituents included in the halogenated aliphatic wastes treatability group were calculated according to the methodology described above and are presented in Table 6-1.

1,2-Dichloropropane;, cis-1,3-dichloropropylene; trans-1,3-dichloropropylene; and 1,1,2-trichloroethane were detected in the untreated waste in only Test 11. According to the treatment standard calculation methodology described above, the detection limit for each of these constituents from Test 11 should be used to calculate the treatment standards. However, the Agency believes that the detection limits from Test 4 are more appropriate for calculating the treatment standards for these constituents. Both the F024 treated in Test 11 and the K019 treated in Test 4 were chlorinated aliphatic wastes; however, detection limits were higher for constituents in the K019 incinerator ash, as this matrix was more difficult to analyze than the F024 matrix. The Agency believes that the higher detection limits for 1,2-dichloropropane, cis-1,3-dichloropropylene, trans-1,3-dichloropropylene, and 1,1,2-trichloroethane from K019 ash in Test 4 represent detection limits that all analytical laboratories can reliably achieve in complex waste matrices. The resulting treatment standards, presented in Table 6-1, account for the anticipated variability in U and P wastes and should be achievable on a routine basis for the majority of the U and P wastes.

6.2.4 Halogenated Pesticide and Chlorobenzene Wastes

With the exceptions of isodrin and kepone, all treatment standards for waste constituents included in the halogenated pesticide and chlorobenzene wastes treatability group were calculated according to the methodology described above and are presented in Table 6-1. Acceptable matrix spike recoveries for incinerator ash were not available for U240, a phenoxyacetic acid herbicide. Therefore, a recovery of 20% was used for this constituent.

As discussed in Section 4.1.2, detection limit data for aldrin from the 11 incineration tests were transferred to calculate the BDAT treatment standard for isodrin in P060 nonwastewaters. The highest detection limit for aldrin from the 11 incineration tests was used to calculate the treatment standard for isodrin and the treatment standard calculated is included in Table 6-1.

The highest detection limit available for kepone from the 11 incineration tests was 0.006 ppm from Test 2. The Agency believes that a treatment standard based on this detection limit is too low to be routinely achievable. A comparison of the available detection limits for kepone in the 14 incineration tests to those of similar compounds analyzed by the same method indicated that the detection limits for kepone are generally six times higher than those of similar compounds analyzed by the same method (for example, gamma-BHC). However, a treatment standard for kepone based on the detection limit of 0.006 ppm from Test 2 would not reflect the 6:1 ratio when compared to the treatment standards for similar compounds analyzed by the same method. Therefore, the Agency believes the detection limit for kepone of 0.006 ppm from Test 2 should be multiplied by a factor of six to calculate the treatment standard for U142. The remainder of the treatment standard calculation for kepone was performed according to the methodology described above. The treatment standard for kepone is included in Table 6-1.

Finally, for U240 (2,4-D and salts and esters), the Agency is specifying both concentration-based treatment standards and a method of treatment as the treatment standard. Because 2,4-D salts and esters are not analyzed as 2,4-D, a numerical treatment standard for 2,4-D does not necessarily represent treatment of salts and esters of U240. Where a facility can reasonably assume that only 2,4-D is being handled, only the concentration-based treatment standard for 2,4-D should be applied. However, should one expect that salts or esters could be formed during storage, treatment, or disposal, the U240 nonwastewaters would have to be incinerated according to the BDAT treatment standard for U240 salts and esters presented in Volume B.

6.2.5 Halogenated Phenolic Wastes

All treatment standards for waste constituents included in the halogenated phenolic wastes treatability group were calculated according to the methodology described above and are presented in Table 6-1.

6.2.6 Miscellaneous Halogenated Organic Wastes

With the exception of vinyl chloride, all treatment standards for waste constituents included in the miscellaneous halogenated organic wastes treatability group were calculated according to the methodology described above and are presented in Table 6-1.

Vinyl chloride was detected in the scrubber water residual in Test 11. The Agency therefore believes that vinyl chloride was present in the untreated waste in Test 11. According to the methodology described above, the detection limit for vinyl chloride in the ash from Test 11. According to the methodology described above, the detection limit for vinyl chloride in the ash from Test 11 should have been used to calculate the treatment standard for U043. The detection limit for vinyl chloride in the incinerator ash from Test 11 was 0.01 ppm. The Agency believes that this detection limit is too low to be routinely achievable in ash by analytical laboratories. Therefore, the highest detection limit for vinyl chloride in ash from all 11 incineration tests was used to calculate the treatment standard for U043. The treatment standard calculated for vinyl chloride is presented in Table 6-1.

6.2.7 Organo-nitrogen Compound Wastes

All treatment standards for waste constituents included in the organo-nitrogen compound wastes treatability group were calculated according to the methodology described above and are presented in Table 6-1.

6.2.8 Oxygenated Hydrocarbon and Heterocyclic Wastes

With the exception of acetone, all treatment standards for waste constituents included in the oxygenated hydrocarbon and heterocyclic wastes treatability group were calculated according to the methodology described above and are presented in Table 6-1.

Acetone was detected in the untreated waste in 3 of the 11 incineration tests, Tests 9, 11, and 13. According to the methodology described above, the highest detection limit for acetone in the ash from Tests 9, 11, and 13 should have been used to calculate the treatment standard for U002. The highest detection limit for acetone in Tests 9, 11, and 13 was 0.01 ppm. The Agency believes that this detection limit is too low to be routinely achievable in ash by analytical laboratories. Therefore, the highest detection limit for acetone from all 11 incineration tests was used to calculate the treatment standard for U002. The treatment standard calculated for acetone is presented in Table 6-1.

6.2.9 Wastes of a Pharmaceutical Nature

All treatment standards for waste constituents included in the wastes of a pharmaceutical nature this treatability group were calculated according to the methodology described above and are presented in Table 6-1.

6.2.10 Phenolics

All treatment standards for waste constituents included in this treatability group were calculated according to the methodology described above and are presented in Table 6-1.

For P047 (4,6-dinitro-o-cresol and salts), the Agency is specifying both concentration-based treatment standards and a method of treatment as the treatment standard. Because 4,6-dinitro-o-cresol salts are not analyzed as 4,6-dinitro-o-cresol, a numerical treatment standard for 4,6-dinitro-o-cresol does not necessarily represent treatment of salts of P047. Where a facility can reasonably assume that only 4,6-dinitro-o-cresol is being handled, only the concentration-based treatment standard for 4,6-dinitro-o-cresol should be applied. However, should one expect that salts could be formed during storage, treatment, or disposal, the P047 nonwastewaters would have to be incinerated according to the treatment standard for P047 salts presented in Volume B.

6.2.11 Polynuclear Aromatic Wastes

With the exceptions of lead in U051 and dibenz(a,h)anthracene, naphthalene, and phenanthrene, all treatment standards for waste constituents included in the polynuclear aromatic wastes treatability group were calculated according to the methodology described above and are presented in Table 6-1.

The treatment standard for lead in U051 nonwastewaters is based on treatment performance data transferred from stabilization of F006, as discussed in Section 4.1.11. The treatment standard for lead in U051 nonwastewaters was calculated as indicated in Table 6-2.

For dibenz(a,h)anthracene, napththalene, and phenanthrene the highest detection limits for each constituent was 2.0 ppm from Test 4. However, the Agency believes that the detection limits from Test 8 are more representative of the detection limits routinely achievable for these polynuclear aromatic constituents. The K087 treated in Test 8 contained the highest concentrations of polynuclear aromatic constituents of any of the wastes treated in the 11 incineration tests. The K019 treated in Test 4 was comprised mostly of halogenated aliphatic constituents. Therefore, the detection limit for each of the constituents dibenz(a,h)anthrancene, naphthalene, and phenanthrene from Test 8 was used to calculate the treatment standards for these constituents presented in Table 6-1.

6.3 Detailed Discussion of Treatment Standard Calculations for Multi-Source Leachate (F039) Constituents

Treatment standards for the majority of the regulated constituents in nonwastewater forms of multi-source leachate (F039) were calculated using the methodology described in Sections 6.1 and 6.2 for U and P wastes. Treatment standards for the remaining regulated constituents in multi-source leachate (F039) nonwastewaters were calculated by the methodology described in the Methodology for Developing Treatment Standards (Reference 2) using data transferred from F, K, and D wastes. A complete list of the regulated nonwastewater multi-source leachate constituents and the treatment standards for F039 is presented in Table 6-4. The specific methodology used to calculate the treatment standard for each multi-source leachate (F039) constituent is discussed in the subsections below.

6.3.1 Multi-Source Leachate (F039) Constituents With a Corresponding U or P Waste

The majority of the regulated organic constituents in nonwastewater forms of multi-source leachate (F039) are also regulated in a U or P waste. For these constituents, the treatment standard was calculated using the data and methodology used for the corresponding U or P waste (except for certain pesticide constituents as described below).

The treatment standards calculated for the U and P waste constituents included in this document are presented in Table 6-1. Six of the regulated nonwastewater multi-source leachate constituents diethyl phthalate, dimethyl phthalate, di-n-butyl phthalate, di-n-octyl phthalate, bis(2-ethylhexyl)phthalate, and barium correspond to a U or P waste that is not included in this background document. Treatment standards calculated for these six constituents are presented in Table 6-3, and were calculated using the methodology described in the Methodology for Developing Treatment Standards (Reference 2). Detailed information on the treatment performance data and the methodology used to calculate the treatment standards for these six constituents can be found in the appropriate background document for each U or P waste code.

For five pesticide constituents, disulfoton, famphur, methyl parathion, parathion, and phorate, the Agency does not believe that the detection limits in incinerator ash are routinely achievable in a leachate nonwastewater matrix. (Data from incinerator ash were used to calculate treatment standards for the U and P waste codes for these constituents.) Therefore, treatment performance data for these leachate constituents are not being transferred from the corresponding U or P waste. The Agency is establishing treatment standards for disulfoton, famphur, parathion, and phorate based on detection limits in a nonwastewater residual resulting from the handling (sludge drying) of multi-source leachate (F039) (Reference 19). These data represent detection limits following the thermal drying of a wastewater treatment sludge generated by the biological treatment of multi-source leachate. The detection limits for parathion are being transferred to methyl parathion. The treatment standards calculated for these five constituents are also presented in Table 6-3.

6.3.2 Multi-Source Leachate (F039) Constituents Without a Corresponding U or P Waste

The treatment standards for the regulated multi-source leachate (F039) constituents that do not have a corresponding U or P waste were calculated using the methodology described in the Methodology for Developing Treatment Standards (Reference 2). In general, the treated waste data for each constituent were corrected for accuracy, then the average of the accuracy-corrected treatment values was multiplied by a variability factor to determine the treatment standard. Treatment standards calculated for these constituents are presented in Table 6-3. Treatment performance data for most of these constituents were transferred from regulated D, F, or K wastes, as indicated in Table 6-3. Detailed information on the treatment performance data and the methodology used to calculate the treatment standards for these constituents can be found in the appropriate background document for each D, F, or K waste. Treatment performance data for bromodichloromethane and chlorodibromomethane were transferred from the ethylene dibromide incineration test conducted by the Agency.

Table 6-1

TREATMENT STANDARD CALCULATIONS FOR NONWASTEWATER U AND P WASTES AND FOR MULTI-SOURCE LEACHATE (F039)

Waste Code	BDAT Number	Constituent	Detected In in Untreated or Treated Waste (Y or N)	Detection Limit (ppm)	Detection Limit Taken From Test #(s) *	Recovery (%)	Recovery Data Transferred From (BDAT #/Test #)*	Accuracy Correction Factor	Corrected Detection Limit (ppm)	Variability Factor	Treatment Standard (ppm) **
AROMATIC WASTES											
U019	4	Benzene	Y	10	2	78	4/2	1.28	12.82	2.8	36
U220	43	Toluene	Y	10	2	99	43/2	1.01	10.10	2.8	28
U239	215-217	Xylenes	Y	10	2	100	9/2	1.00	10.00	2.8	28
HALOGENATED ALIPHATIC WASTES											
U044	14	Chloroform	Y	2	4	100	47/4	1.00	2.00	2.8	5.6
U076	22	1,1-Dichloroethane	Y	2	4	78	24/4	1.28	2.56	2.8	7.2
U077	23	1,2-Dichloroethane	Y	2	4	78	24/4	1.28	2.56	2.8	7.2
U078	24	1,1-Dichloroethylene	N	10	2	86	24/2	1.16	11.63	2.8	33
U079	25	trans-1,2-Dichloroethylene	N	10	2	86	24/2	1.16	11.63	2.8	33
U080	38	Methylene chloride	Y	10	1	84	47/1	1.19	11.90	2.8	33
U083	26	1,2-Dichloropropane	Y	5	4	78	24/4	1.28	6.41	2.8	18
U084	28	cis-1,3-Dichloropropylene	Y	5	4	78	24/4	1.28	6.41	2.8	18
U084	27	trans-1,3-Dichloropropylene	Y	5	4	78	24/4	1.28	6.41	2.8	18
U131	113	Hexachloroethane	Y	10	4	100	47/4	1.00	10.00	2.8	28
U208	40	1,1,1,2-Tetrachloroethane	N	10	2	67	47/2	1.49	14.93	2.8	42
U209	41	1,1,2,2-Tetrachloroethane	Y	10	2	67	47/2	1.49	14.93	2.8	42
U210	42	Tetrachloroethylene	Y	2	4	100	47/4	1.00	2.00	2.8	5.6
U211	7	Carbon tetrachloride	Y	2	4	100	47/4	1.00	2.00	2.8	5.6
U226	45	1,1,1-Trichloroethane	Y	2	4	100	47/4	1.00	2.00	2.8	5.6
U227	46	1,1,2-Trichloroethane	Y	2	4	100	47/4	1.00	2.00	2.8	5.6
U228	47	Trichloroethylene	Y	2	4	100	47/4	1.00	2.00	2.8	5.6
U243	115	Hexachloropropylene	N	10	4	100	47/4	1.00	10.00	2.8	28
HALOGENATED PESTICIDE AND CHLOROBENZENE WASTES											
P004	172	Aldrin	N	0.0066	13,14	28	186/13	3.57	0.02	2.8	0.066
P037	181	Dieldrin	N	0.013	13,14	28	186/13	3.57	0.05	2.8	0.13
P050	182	Endosulfan I	N	0.0066	13,14	28	186/13	3.57	0.02	2.8	0.066
P050	183	Endosulfan II	N	0.013	13,14	28	186/13	3.57	0.05	2.8	0.13
P050	238	Endosulfan sulfate	N	0.013	13,14	28	186/13	3.57	0.05	2.8	0.13
P051	184	Endrin	N	0.013	13,14	28	186/13	3.57	0.05	2.8	0.13
P051	185	Endrin aldehyde	N	0.013	13,14	28	186/13	3.57	0.05	2.8	0.13
P059	186	Heptachlor	Y	0.0066	13	28	186/13	3.57	0.02	2.8	0.066
P059	187	Heptachlor epoxide	N	0.0066	13,14	28	186/13	3.57	0.02	2.8	0.066
P060	188	Isodrin	N	0.0066	13,14	28	186/13	3.57	0.02	2.8	0.066
P123	191	Toxaphene	N	0.13	13,14	28	186/13	3.57	0.46	2.8	1.3
U036	177	Chlordane (alpha and gamma)	Y	0.013	13	28	186/13	3.57	0.05	2.8	0.13
U037	9	Chlorobenzene	Y	2	4	99	9/4	1.01	2.02	2.8	5.7
U060	235	o,p'-DDD	N	0.013	13,14	42	190/14	2.38	0.03	2.8	0.087
U060	178	p,p'-DDD	N	0.013	13,14	42	190/14	2.38	0.03	2.8	0.087
U061	235	o,p'-DDD	N	0.013	13,14	42	190/14	2.38	0.03	2.8	0.087
U061	178	p,p'-DDD	N	0.013	13,14	42	190/14	2.38	0.03	2.8	0.087
U061	236	o,p'-DDE	N	0.013	13,14	42	190/14	2.38	0.03	2.8	0.087
U061	179	p,p'-DDE	N	0.013	13,14	42	190/14	2.38	0.03	2.8	0.087

* Treatment test number is indicated in Table 4-1.

** Treatment standards apply to U and P wastes and to multi-source leachate.

Table 6-1 (Continued)

TREATMENT STANDARD CALCULATIONS FOR NONWASTEWATER U AND P WASTES AND FOR MULTI-SOURCE LEACHATE (F039)

Waste Code	BDAT Number	Constituent	Detected In in Untreated or Treated Waste (Y or N)	Detection Limit (ppm)	Detection Limit Taken From Test #(s) *	Recovery (%)	Recovery Data Transferred From (BDAT #/Test #)*	Accuracy Correction Factor	Corrected Detection Limit (ppm)	Variability Factor	Treatment Standard (ppm)
HALOGENATED PESTICIDE AND CHLOROBENZENE WASTES (continued)											
U061	237	o,p'-DDT	N	0.013	13,14	42	190/14	2.38	0.03	2.8	0.087
U061	180	p,p'-DDT	N	0.013	13,14	42	190/14	2.38	0.03	2.8	0.087
U070	87	o-Dichlorobenzene	Y	2	4	90	88/4	1.11	2.22	2.8	6.2
U071	86	m-Dichlorobenzene	N	2	4	90	88/4	1.11	2.22	2.8	6.2
U072	88	p-Dichlorobenzene	Y	2	4	90	88/4	1.11	2.22	2.8	6.2
U127	110	Hexachlorobenzene	Y	10	4	75	150/4	1.33	13.33	2.8	37
U128	111	Hexachlorobutadiene	Y	10	4	100	47/4	1.00	10.00	2.8	28
U129	173	alpha-BHC	N	0.0066	13,14	28	186/13	3.57	0.02	2.8	0.066
U129	174	beta-BHC	N	0.0066	13,14	28	186/13	3.57	0.02	2.8	0.066
U129	175	delta-BHC	N	0.0066	13,14	28	186/13	3.57	0.02	2.8	0.066
U129	176	gamma-BHC (Lindane)	N	0.0066	13,14	28	186/13	3.57	0.02	2.8	0.066
U130	112	Hexachlorocyclopentadiene	Y	0.36	13	28	186/13	3.57	1.29	2.8	3.6
U142	189	Kepone	N	0.036	2	75	187/2	1.33	0.05	2.8	0.13
U183	136	Pentachlorobenzene	Y	10	4	75	150/4	1.33	13.33	2.8	37
U185	138	Pentachloronitrobenzene	Y	0.36	13	21	110/13	4.76	1.71	2.8	4.8
U207	148	1,2,4,5-Tetrachlorobenzene	Y	5	4	75	150/4	1.33	6.67	2.8	19
U240	192	2,4-Dichlorophenoxyacetic acid	Y	0.2	13	20	192/13	5.00	1.00	10.13	10
U247	190	Methoxychlor	Y	0.013	13	20	190/13	5.00	0.07	2.8	0.18
HALOGENATED PHENOLIC WASTES											
U039	76	p-Chloro-m-cresol	N	5	4	100	76/4	1.00	5.00	2.8	14
U048	78	2-Chlorophenol	N	2	4	98	78/4	1.02	2.04	2.8	5.7
U081	90	2,4-Dichlorophenol	Y	5	4	98	78/4	1.02	5.10	2.8	14
U082	91	2,6-Dichlorophenol	Y	5	4	98	78/4	1.02	5.10	2.8	14
OXYGENATED HYDROCARBON AND HETEROCYCLIC WASTES											
U002	222	Acetone	Y	50	2	86	24/2	1.16	58.14	2.8	160
U004	53	Acetophenone	N	2	4,8,10	58	102/10	1.72	3.45	2.8	9.7
U031	223	n-Butyl alcohol	N	0.4	13,14	43	229/14	2.33	0.93	2.8	2.6
U108	29	1,4-Dioxane	N	60	10	100	4/10	1.00	60.00	2.8	170
U112	225	Ethyl acetate	Y	10	2	86	24/2	1.16	11.63	2.8	33
U117	227	Ethyl ether	N	50	1	86	24/2	1.16	58.14	2.8	160
U118	31	Ethyl methacrylate	N	50	2	86	24/2	1.16	58.14	2.8	160
U140	33	Isobutyl alcohol	N	60	10	100	24/10	1.00	60.00	2.8	170
U159	34	Methyl ethyl ketone	Y	10	4	78	24/4	1.28	12.82	2.8	36
U161	229	Methyl isobutyl ketone	Y	10	1	84	47/1	1.19	11.90	2.8	33
U162	35	Methyl methacrylate	N	50	2	86	24/2	1.16	58.14	2.8	160
WASTES OF A PHARMACEUTICAL NATURE											
U141	117	Isosafrole	Y	0.36	14	39	117/14	2.56	0.92	2.8	2.6
U155	118	Methapyrilene	N	0.36	13,14	69	144/13	1.45	0.52	2.8	1.5
U187	140	Phenacetin	N	5	1	90	127/1	1.11	5.56	2.8	16
U203	147	Safrole	N	5	1,8,10	64	76/10	1.56	7.81	2.8	22

* Treatment test number is indicated in Table 4-1.

** Treatment standards apply to U and P wastes and to multi-source leachate.

Table 6-1 (Continued)

TREATMENT STANDARD CALCULATIONS FOR NONWASTEWATER U AND P WASTES AND FOR MULTI-SOURCE LEACHATE (F039)

Waste Code	BDAT Number	Constituent	Detected In in Untreated or Treated Waste (Y or N)	Detection Limit (ppm)	Detection Limit Taken From Test #(s) *	Recovery (%)	Recovery Data Transferred From (BDAT #/Test #)*	Accuracy Correction Factor	Corrected Detection Limit (ppm)	Variability Factor	Treatment Standard (ppm)
PHENOLIC WASTES											
P020	73	2-sec-Butyl-4,6-dinitrophenol (Dinoseb)	Y	0.36	14	41	73/14	2.44	0.88	2.8	2.5
P047	100	4,6-Dinitro-o-cresol	N	50	4	90	142/4	1.11	55.56	2.8	160
P048	101	2,4-Dinitrophenol	N	50	4	90	142/4	1.11	55.56	2.8	160
U052	82	Cresol (m- and p- isomers)	Y	1	8	87	76/8	1.15	1.15	2.8	3.2
U052	81	o-Cresol	Y	2	4	100	76/4	1.00	2.00	2.8	5.6
U101	96	2,4-Dimethylphenol	N	5	4	100	76/4	1.00	5.00	2.8	14
U170	127	4-Nitrophenol	N	10	4	97	127/4	1.03	10.31	2.8	29
U188	142	Phenol	Y	2	4	90	142/4	1.11	2.22	2.8	6.2
POLYNUCLEAR AROMATIC WASTES											
U005	54	2-Acetylaminofluorene	N	50	1	100	52/1	1.00	50.0	2.8	140
U018	59	Benz(a)anthracene	Y	1	8	34	145/8	2.94	2.94	2.8	8.2
U022	62	Benzo(a)pyrene	Y	1	8	34	145/8	2.94	2.94	2.8	8.2
U050	80	Chrysene	Y	1	8	34	145/8	2.94	2.94	2.8	8.2
U051	121	Creosote-Naphthalene	Y	1	8	91	52/8	1.10	1.10	2.8	3.1
U051	139	Creosote-Pentachlorophenol	Y	3	1	95	139/1	1.05	2.63	2.8	7.4
U051	141	Creosote-Phenanthrene	Y	1	8	91	52/8	1.10	1.10	2.8	3.1
U051	145	Creosote-Pyrene	Y	1	8	34	145/8	2.94	2.94	2.8	8.2
U051	43	Creosote-Toluene	Y	10	2	99	43/2	1.01	10.1	2.8	28
U051	215-217	Creosote-Xylenes	Y	10	2	99	43/2	1.01	10.1	2.8	28
U063	83	Dibenz(a,h)anthracene	N	1	8	34	145/8	2.94	2.94	2.8	8.2
U120	108	Fluoranthene	Y	1	8	34	145/8	2.94	2.94	2.8	8.2
U137	116	Indeno(1,2,3-c,d)pyrene	Y	1	8	34	145/8	2.94	2.94	2.8	8.2
U157	119	3-Methylcholanthrene	N	5	1	96	145/1	1.04	5.21	2.8	15
U165	121	Naphthalene	Y	1	8	91	52/8	1.10	1.10	2.8	3.1
ORGANO-NITROGEN COMPOUND WASTES											
P077	125	p-Nitroaniline	N	10	4	100	102/4	1.00	10.00	2.8	28
P101	30	Ethyl cyanide (Propanenitrile)	N	100	4,7	78	24/4	1.28	128.21	2.8	360
U009	3	Acrylonitrile	Y	30	10	100	24/10	1.00	30.00	2.8	84
U012	56	Aniline	Y	5	4	97	127/4	1.03	5.15	2.8	14
U105	102	2,4-Dinitrotoluene	N	50	4	100	102/4	1.00	50.00	2.8	140
U106	103	2,6-Dinitrotoluene	N	10	4	100	102/4	1.00	10.00	2.8	28
U111	105	Di-n-propylnitrosamine	N	5	4	100	105/4	1.00	5.00	2.8	14
U152	37	Methacrylonitrile	N	30	10	100	24/10	1.00	30.00	2.8	84
U169	126	Nitrobenzene	Y	5	4	97	127/4	1.03	5.15	2.8	14
U172	128	N-Nitrosodi-n-butylamine	N	5	1,4	81	105/1	1.23	6.17	2.8	17
U174	129	N-Nitrosodiethylamine	N	10	4	100	105/4	1.00	10.00	2.8	28
U179	133	N-Nitrosopiperidine	N	10	1,4	81	105/1	1.23	12.35	2.8	35
U180	134	N-Nitrosopyrrolidine	N	10	1,4	81	105/1	1.23	12.35	2.8	35
U181	135	5-Nitro-o-toluidine	N	10	1	100	102/1	1.00	10.00	2.8	28
U196	39	Pyridine	Y	5	1	88	4/1	1.14	5.68	2.8	16

* Treatment test number is indicated in Table 4-1.

** Treatment standards apply to U and P wastes and to multi-source leachate.

Table 6-1 (Continued)
TREATMENT STANDARD CALCULATIONS FOR NONWASTEWATER U AND P WASTES AND FOR MULTI-SOURCE LEACHATE (F039)

Waste Code	BDAT Number	Constituent	Detected In in Untreated or Treated Waste (Y or N)	Detection Limit (ppm)	Detection Limit Taken From Test #(s) *	Recovery (%)	Recovery Data Transferred From (BDAT #/Test #)*	Accuracy Correction Factor	Corrected Detection Limit (ppm)	Variability Factor	Treatment Standard (ppm)
MISCELLANEOUS HALOGENATED ORGANIC WASTES											
P024	74	p-Chloroaniline	N	5	1,4	90	127/1	1.11	5.56	2.8	16
U024	67	Bis(2-chloroethoxy)methane	N	2	4	78	24/4	1.28	2.56	2.8	7.2
U025	68	Bis(2-chloroethyl)ether	Y	2	4	78	24/4	1.28	2.56	2.8	7.2
U027	69	Bis(2-chloroisopropyl)ether	N	2	4	78	24/4	1.28	2.56	2.8	7.2
U043	50	Vinyl chloride	Y	10	2	86	24/2	1.16	11.63	2.8	33
U045	15	Chloromethane (Methyl chloride)	Y	10	2	86	24/2	1.16	11.63	2.8	33
U047	77	2-Chloronaphthalene	N	2	4	100	52/4	1.00	2.00	2.8	5.6
U075	21	Dichlorodifluoromethane	Y	2	4,7	78	24/4	1.28	2.56	2.8	7.2
U121	48	Trichloromonofluoromethane	N	10	2	86	24/2	1.16	11.63	2.8	33
U138	32	Iodomethane	N	20	2	86	24/2	1.16	23.26	2.8	65
U158	120	4,4'-Methylenebis(2-chloroaniline)	N	10	1	81	105/1	1.23	12.35	2.8	35
U192	144	Pronamide	Y	0.33	13	69	144/13	1.45	0.48	2.8	1.5

* Treatment test number is indicated in Table 4-1.

** Treatment standards apply to U and P wastes and to multi-source leachate.

Table 6-2

TREATMENT STANDARD CALCULATIONS FOR NONWASTEWATER U AND P WASTES THAT ARE BASED ON PERFORMANCE DATA OTHER THAN THE ELEVEN INCINERATION TESTS

Regulated Constituent (SW-846 Method Number)	Constituent from which Treatment performance Data were Transferred	Arithmetic Average of Corrected Treatment Performance Values (ppm)	Variability Factor (VF)	Treatment Standard (Average x VF) (ppm)
BROMINATED ORGANIC WASTES				
U029 Bromomethane (Methyl bromide)	Ethylene dibromide (EDB Test Burn)	5.41	2.8	15
U066 1,2-Dibromo-3-chloropropane	Ethylene dibromide (EDB Test Burn)	5.41	2.8	15
U067 1,2-Dibromomethane (Ethylene dibromide)	Ethylene dibromide (EDB Test Burn)	5.41	2.8	15
U068 Dibromomethane	Ethylene dibromide (EDB Test Burn)	5.41	2.8	15
U225 Bromoform (Tribromomethane)	Ethylene dibromide (EDB Test Burn)	5.41	2.8	15
U030 4-Bromophenyl phenyl ether	Ethylene dibromide (EDB Test Burn)	5.41	2.8	15
POLYNUCLEAR AROMATIC WASTES				
U051 Lead	Lead (F006)	0.37	1.37	0.51*

* This treatment standard applies to the concentration of the constituent in the TCLP leachate.

Table 6-3

TREATMENT STANDARD CALCULATIONS FOR MULTI-SOURCE LEACHATE (F039)
CONSTITUENTS THAT ARE BASED ON PERFORMANCE DATA OTHER
THAN THE ELEVEN INCINERATION TESTS

BDAT List Constituent	Waste Code/Constituent From Which Treatment Performance Data Were Transferred	Average Concentration in the Treatment Residual (ppm)	Accuracy Correction Factor	Variability Factor	Treatment Standard (ppm)
ORGANICS					
51. Acenaphthalene	K087/51	1.00	1.217	2.8	3.4
52. Acenaphthene	K001-C/52	0.65	2.174	2.8	4.0
57. Anthracene	K001-C/57	0.65	2.174	2.8	4.0
200. Aroclor 1016	K085/190	0.33 a	---	2.8	0.92
201. Aroclor 1221	K085/190	0.33 a	---	2.8	0.92
202. Aroclor 1232	K085/190	0.33 a	---	2.8	0.92
203. Aroclor 1242	K085/190	0.33 a	---	2.8	0.92
204. Aroclor 1248	K085/190	0.33 a	---	2.8	0.92
205. Aroclor 1254	K085/190	0.65 a	---	2.8	1.8
206. Aroclor 1260	K085/190	0.65 a	---	2.8	1.8
63. Benzo(b)fluoranthene	K087/63	1.00	1.217	2.8	3.4
65. Benzo(k)fluoranthene	K087/65	1.00	1.217	2.8	3.4
64. Benzo(g,h,i)perylene	F024/64	0.336	1.613	2.8	1.5
70. Bis(2-ethylhexyl)phthalate	U028/70	<8.2	1.190	2.8	28.
5. Bromodichloromethane	EDB Test Burn/18	5.41 b	---	2.8	15.
72. Butyl benzyl phthalate	K019 RCRA Blend/70	3.67	1.000	2.16	7.9
11. Chlorodibromomethane	EDB Test Burn/18	5.41 b	---	2.8	15.
12. Chloroethane	K019/23	2.00	1.064	2.8	6.0
16. 3-Chloropropylene	K019/113	10.00	1.000	2.8	28.
92. Diethyl phthalate	U088/92	<8.2	1.190	2.8	28.
97. Dimethyl phthalate	U102/97	<8.2	1.190	2.8	28.
98. Di-n-butyl phthalate	U069/98	<8.2	1.190	2.8	28.
99. 1,4-Dinitrobenzene	3rd 3rd Test Burn+/73	0.3375	2.439	2.8	2.3

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a - Arithmetic average of corrected treated waste values. The accuracy correction factors for this constituent are presented in the background document for the appropriate waste code.

b - Arithmetic average of corrected treated waste values.

c - 1 ppb represents the analytica detection limit that can be achieved for these constituents by laboratories in the United States, and is consistent with the detection limit for dioxins in F024.

d - This is the Characteristic Level based on the Extraction Procedure (EP) toxicity test.

+ - Test burn conducted by the Agency at John Zink Co., Tulsa, OK (Reference 17).

Table 6-3 (Continued)

TREATMENT STANDARD CALCULATIONS FOR MULTI-SOURCE LEACHATE (F039)
CONSTITUENTS THAT ARE BASED ON PERFORMANCE DATA OTHER
THAN THE ELEVEN INCINERATION TESTS

BDAT List Constituent	Waste Code/Constituent From Which Treatment Performance Data Were Transferred	Average Concentration in the Treatment Residual (ppm)	Accuracy Correction Factor	Variability Factor	Treatment Standard (ppm)
ORGANICS (Continued)					
104. Di-n-octyl phthalate	U107/104	<8.2	1.190	2.8	28.
195. Disulfoton	Leachate Data/195	2.00	1.099	2.8	6.2
226. Ethyl benzene	K019 RCRA Blend/226	2.00	1.067	2.8	6.0
196. Famphur	Leachate Data/196	5.00	1.099	2.8	15.
109. Fluorene	K001-C/109	0.65	2.174	2.8	4.0
208. Hexachlorodibenzofurans	F024/-	---	---	---	0.001 c
207. Hexachlorodibenzo-p-dioxins	F024/-	---	---	---	0.001 c
197. Methyl parathion	Leachate Data/198	1.5	1.099	2.8	4.6
131. N-Nitrosomethylethylamine	3rd 3rd Test Burn+/73	0.3375	2.439	2.8	2.3
132. N-Nitrosomorpholine	3rd 3rd Test Burn+/73	0.3375	2.439	2.8	2.3
198. Parathion	Leachate Data/198	1.5	1.099	2.8	4.6
210. Pentachlorodibenzofurans	F024/-	---	---	---	0.001 c
209. Pentachlorodibenzo-p-dioxins	F024/-	---	---	---	0.001 c
199. Phorate	Leachate Data/199	1.5	1.099	2.8	4.6
193. Silvex (2,4,5-TP)	3rd 3rd Test Burn+/192	0.155	5.000	10.13	7.9
194. 2,4,5-T	3rd 3rd Test Burn+/192	0.155	5.000	10.13	7.9
212. Tetrachlorodibenzofurans	F024/-	---	---	---	0.001 c
211. Tetrachlorodibenzo-p-dioxins	F024/-	---	---	---	0.001 c
149. 2,3,4,6-Tetrachlorophenol	K001-PCP/139	12.5	1.053	2.8	37.
150. 1,2,4-Trichlorobenzene	K019/150	5.0	1.333	2.8	19.
151. 2,4,5-Trichlorophenol	K001-PCP/139	12.5	1.053	2.8	37.
152. 2,4,6-Trichlorophenol	K001-PCP/139	12.5	1.053	2.8	37.

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a - Arithmetic average of corrected treated waste values. The accuracy correction factors for this constituent are presented in the background document for the appropriate waste code.

b - Arithmetic average of corrected treated waste values.

c - 1 ppb represents the analytica detection limit that can be achieved for these constituents by laboratories in the United States, and is consistent with the detection limit for dioxins in F024.

d - This is the Characteristic Level based on the Extraction Procedure (EP) toxicity test.

+ - Test burn conducted by the Agency at John Zink Co., Tulsa, OK (Reference 17).

Table 6-3 (Continued)

TREATMENT STANDARD CALCULATIONS FOR MULTI-SOURCE LEACHATE (F039)
CONSTITUENTS THAT ARE BASED ON PERFORMANCE DATA OTHER
THAN THE ELEVEN INCINERATION TESTS

BDAT List Constituent	Waste Code/Constituent From Which Treatment Performance Data Were Transferred	Average Concentration in the Treatment Residual (ppm)	Accuracy Correction Factor	Variability Factor	Treatment Standard (ppm)
ORGANICS (Continued)					
49. 1,2,3-Trichloropropane	K019/113	10.	1.00	2.8	28.
231. 1,1,2-Trichloro-1,2,2-trifluoroethane	K019/113	10.	1.00	2.8	28.
INORGANICS					
169. Cyanide (total)	K048-K052/169	0.27 a	---	6.4	1.8
					TCLP Leachate (mg/l)
METALS					
154. Antimony	K021/154	<0.060	1.35	2.8	0.23
155. Arsenic	D004/155				5.0 d
156. Barium	P013/156	12.7	1.176	3.50	52.
158. Cadmium	F006/158	0.018 a	---	3.72	0.066
159. Chromium (total)	F006/159	0.66 a	---	7.94	5.2
161. Lead	F006/161	0.37 a	---	1.37	0.51
162. Mercury	K071/162	0.0043 a	---	5.47	0.025
163. Nickel	F006/163	0.072 a	---	4.47	0.32
164. Selenium	D010/164	0.674	1.176	7.15	5.7
165. Silver	F006/165	0.056 a	---	1.29	0.072

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a - Arithmetic average of corrected treated waste values. The accuracy correction factors for this constituent are presented in the background document for the appropriate waste code.

b - Arithmetic average of corrected treated waste values.

c - 1 ppb represents the analytica detection limit that can be achieved for these constituents by laboratories in the United States, and is consistent with the detection limit for dioxins in F024.

d - This is the Characteristic Level based on the Extraction Procedure (EP) toxicity test.

+ - Test burn conducted by the Agency at John Zink Co., Tulsa, OK (Reference 17).

Table 6-4

NONWASTEWATER TREATMENT STANDARDS FOR MULTI-SOURCE LEACHATE (F039) CONSTITUENTS

Regulated Organic Constituents	Waste Code From Which Treatment Performance Data Were Transferred	Treatment Standard (mg/kg)
Acenaphthalene	K087	3.4
Acenaphthene	K001-C	4.0
Acetone	U002	160
Acetophenone	U004	9.7
2-Acetylaminofluorene	U005	140
Acrylonitrile	U009	84
Aldrin	P004	0.066
Aniline	U012	14
Anthracene	K001-C	4.0
Aroclor 1016	K085	0.92
Aroclor 1221	K085	0.92
Aroclor 1232	K085	0.92
Aroclor 1242	K085	0.92
Aroclor 1248	K085	0.92
Aroclor 1254	K085	1.8
Aroclor 1260	K085	1.8
Benz(a)anthracene	U018	8.2
Benzene	U019	36
Benzo(b)fluoranthene	K087	3.4
Benzo(k)fluoranthene	K087	3.4
Benzo(g,h,i)perylene	F024	1.5
Benzo(a)pyrene	U022	8.2
alpha-BHC	U129	0.066
beta-BHC	U129	0.066
delta-BHC	U129	0.066
gamma-BHC (Lindane)	U129	0.066
Bis(2-chloroethoxy)methane	U024	7.2
Bis(2-chloroethyl)ether	U025	7.2
Bis(2-chloroisopropyl)ether	U027	7.2
Bis(2-ethylhexyl)phthalate	U028	28
Bromodichloromethane	EDB Test Burn	15
Bromomethane (Methyl bromide)	U029	15
4-Bromophenyl phenyl ether	U030	15
n-Butyl alcohol	U031	2.6
Butyl benzyl phthalate	K019 RCRA Blend	7.9
2-sec-Butyl-4,6-dinitrophenol (Dinoseb)	P020	2.5
Carbon tetrachloride	U211	5.6
Chlordane (alpha and gamma)	U036	0.13
p-Chloroaniline	P024	16
Chlorobenzene	U037	5.7
Chlorodibromomethane	EDB Test Burn	15
Chloroethane	K019	6.0
Chloroform	U044	5.6
p-Chloro-m-cresol	U039	14
Chloromethane (Methyl chloride)	U045	33
2-Chloronaphthalene	U047	5.6
2-Chlorophenol	U048	5.7
3-Chloropropylene	K019	28
Chrysene	U050	8.2

Table 6-4 (Continued)

NONWASTEWATER TREATMENT STANDARDS FOR MULTI-SOURCE LEACHATE (F039) CONSTITUENTS

Regulated Organic Constituents	Waste Code From Which Treatment Performance Data Were Transferred	Treatment Standard (mg/kg)
Cresol (m- and p- isomers)	U052	3.2
o-Cresol	U052	5.6
o,p'-DDD	U060-U061	0.087
p,p'-DDD	U060-U061	0.087
o,p'-DDE	U061	0.087
p,p'-DDE	U061	0.087
o,p'-DDT	U061	0.087
p,p'-DDT	U061	0.087
Dibenz(a,h)anthracene	U063	8.2
1,2-Dibromo-3-chloropropane	U066	15
1,2-Dibromoethane (Ethylene dibromide)	U067	15
Dibromomethane	U068	15
m-Dichlorobenzene	U071	6.2
o-Dichlorobenzene	U070	6.2
p-Dichlorobenzene	U072	6.2
Dichlorodifluoromethane	U075	7.2
1,1-Dichloroethane	U076	7.2
1,2-Dichloroethane	U077	7.2
1,1-Dichloroethylene	U078	33
trans-1,2-Dichloroethylene	U079	33
2,4-Dichlorophenol	U081	14
2,6-Dichlorophenol	U082	14
2,4-Dichlorophenoxyacetic acid	U240	10
1,2-Dichloropropane	U083	18
cis-1,3-Dichloropropylene	U084	18
trans-1,3-Dichloropropylene	U084	18
Dieldrin	P037	0.13
Diethyl phthalate	U088	28
2,4-Dimethylphenol	U101	14
Dimethyl phthalate	U102	28
Di-n-butyl phthalate	U069	28
1,4-Dinitrobenzene	3rd 3rd Test Burn	2.3
4,6-Dinitro-o-cresol	P047	160
2,4-Dinitrophenol	P048	160
2,4-Dinitrotoluene	U105	140
2,6-Dinitrotoluene	U106	28
Di-n-octyl phthalate	U107	28
Di-n-propylnitrosamine	U111	14
1,4-Dioxane	U108	170
Disulfoton	Leachate Data	6.2
Endosulfan I	P050	0.066
Endosulfan II	P050	0.13
Endosulfan sulfate	P050	0.13
Endrin	P051	0.13
Endrin aldehyde	P051	0.13
Ethyl acetate	U112	33
Ethyl benzene	K019 RCRA Blend	6.0
Ethyl cyanide (Propanenitrile)	P101	360
Ethyl ether	U117	160

Table 6-4 (Continued)

NONWASTEWATER TREATMENT STANDARDS FOR MULTI-SOURCE LEACHATE (F039) CONSTITUENTS

Regulated Organic Constituents	Waste Code From Which Treatment Performance Data Were Transferred	Treatment Standard (mg/kg)
Ethyl methacrylate	U118	160
Famphur	Leachate Data	15
Fluoranthene	U120	8.2
Fluorene	K001-C	4.0
Heptachlor	P059	0.066
Heptachlor epoxide	P059	0.066
Hexachlorobenzene	U127	37
Hexachlorobutadiene	U128	28
Hexachlorocyclopentadiene	U130	3.6
Hexachlorodibenzofurans	F024	0.001
Hexachlorodibenzo-p-dioxins	F024	0.001
Hexachloroethane	U131	28
Hexachloropropylene	U243	28
Indeno(1,2,3-c,d)pyrene	U137	8.2
Iodomethane	U138	65
Isobutyl alcohol	U140	170
Isodrin	P060	0.066
Isosafrole	U141	2.6
Kepone	U142	0.13
Methacrylonitrile	U152	84
Methapyrilene	U155	1.5
Methoxychlor	U247	0.18
Methyl ethyl ketone	U159	36
Methyl isobutyl ketone	U161	33
Methyl methacrylate	U162	160
Methyl parathion	Leachate Data	4.6
3-Methylcholanthrene	U157	15
4,4'-Methylenebis(2-chloroaniline)	U158	35
Methylene chloride	U080	33
Naphthalene	U165	3.1
p-Nitroaniline	P077	28
Nitrobenzene	U169	14
5-Nitro-o-toluidine	U181	28
4-Nitrophenol	U170	29
N-Nitrosodiethylamine	U174	28
N-Nitrosodi-n-butylamine	U172	17
N-Nitrosomethylethylamine	3rd 3rd Test Burn	2.3
N-Nitrosomorpholine	3rd 3rd Test Burn	2.3
N-Nitrosopiperidine	U179	35
N-Nitrosopyrrolidine	U180	35
Parathion	Leachate Data	4.6
Pentachlorobenzene	U183	37
Pentachlorodibenzofurans	F024	0.001
Pentachlorodibenzo-p-dioxins	F024	0.001
Pentachloronitrobenzene	U185	4.8
Pentachlorophenol	U051	7.4
Phenacetin	U187	16
Phenanthrene	U051	3.1
Phenol	U188	6.2
Phorate	Leachate Data	4.6

Table 6-4 (Continued)

NONWASTEWATER TREATMENT STANDARDS FOR MULTI-SOURCE LEACHATE (F039) CONSTITUENTS

Regulated Organic Constituents	Waste Code From Which Treatment Performance Data Were Transferred	Treatment Standard (mg/kg)
Pronamide	U192	1.5
Pyrene	U051	8.2
Pyridine	U196	16
Safrole	U203	22
Silvex (2,4,5-TP)	3rd 3rd Test Burn	7.9
1,2,4,5-Tetrachlorobenzene	U207	19
Tetrachlorodibenzofurans	F024	0.001
Tetrachlorodibenzo-p-dioxins	F024	0.001
1,1,1,2-Tetrachloroethane	U208	42
1,1,2,2-Tetrachloroethane	U209	42
Tetrachloroethene	U210	5.6
2,3,4,6-Tetrachlorophenol	K001-PCP	37
Toluene	U220	28
Toxaphene	P123	1.3
Tribromomethane (Bromoform)	U225	15
1,2,4-Trichlorobenzene	K019	19
1,1,1-Trichloroethane	U226	5.6
1,1,2-Trichloroethane	U227	5.6
Trichloroethylene	U228	5.6
Trichloromonofluoromethane	U121	33
2,4,5-Trichlorophenol	K001-PCP	37
2,4,6-Trichlorophenol	K001-PCP	37
2,4,5-Trichlorophenoxyacetic acid	3rd 3rd Test Burn	7.9
1,2,3-Trichloropropane	K019	28
1,1,2-Trichloro-1,2,2-trifluoroethane	K019	28
Vinyl chloride	U043	33
Xylenes	U239	28
Regulated Inorganic Constituents:		
Cyanides (total)	K048-K052	1.8

Regulated Metal Constituents	Waste Code From Which Treatment Performance Data Were Transferred	Treatment Standard TCLP (mg/l)
Antimony	K021	0.23
Arsenic	D004	5.0[a]
Barium	P013	52
Cadmium	F006	0.066
Chromium (total)	F006	5.2
Lead	F006	0.51
Mercury	K071	0.025
Nickel	F006	0.32
Selenium	D010	5.7
Silver	F006	0.072

[a] Based on EP Toxicity.

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APPENDIX A

U AND P WASTE GENERATOR INFORMATION

TABLE A-1

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U001	Acetaldehyde	Food Processing	Synthetic flavor ingredient
		Plastics and Resins Manufacturing	Manufacture of resins and plastics
		Dyes and Pigments Manufacturing	Manufacture of dyes
		Cosmetics and Fragrances	Manufacture of perfumes
		Organic Chemical Manufacturing	Chemical intermediate for pyridine, pyridine bases, pentaerythritol, 1,3-butylene glycol, chloral, glyoxal, crotonaldehyde, acetaldehyde 1,1-dimethylhydrazone, acetaldehyde cyanohydrin, acetaldehyde oxime, paraldehyde, metaldehyde, halogenated derivatives, acetaldol, sodium sulphite addition product, acetic anhydride, ethylidene diacetate, alkyl amine, ethyl acetate, isobutyl acetate, lactic acid, acetic acid, peracetic acid Monomer for polyacetaldehyde and comonomer for polymers
		Agricultural Chemical Manufacturing	Chemical intermediate for pesticides
		Film	Chemical intermediate for photographic formulations
			Alcohol denaturant
U002	Acetone	Fiber Manufacturing	Spinning solvent for cellulose acetate
		Electronic Components Manufacturing	Cleaning and drying electronic parts
		Paint Manufacturing	Solvent for paints, varnishes, lacquers
		Plastics and Resins Manufacturing	Solvent for resins and plastics
		Pharmaceutical Manufacturing	Solvent in the manufacture of pharmaceuticals
		Explosives	Manufacture of smokeless powder
		Organic Chemical Manufacturing	Solvent for fats, oils waxes Manufacture of mesityl oxide, acetic acid, diacetone, alcohol, chloroform, iodoform, bromoform, acetic anhydride Chemical intermediate for methacrylates, methyl isobutyl ketone, methyl isobutyl carbinol, bisphenol A, isophorone
		Printing	Solvent for printing inks
U003	Acetonitrile		Deodorizers for specialty naphthas
			Solvent for inorganic compounds
			Specialty solvent

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U003	(continued)		Polar solvent
			Starting material for many nitrogen-containing compounds
			Recrystallizing steroids
		Food Processing	Extraction of fatty acids from fish liver,animal&veg. oils
			Non-aqueous solvent for inorganic salts
		Metal Finishing	Brightners for metal
			Chemical intermediate -gamma-naphthaleneacetic acid,etc.
		Dyes and Pigments	In miscellaneous operations for cyanide dyes
			Medium for promoting ionization
			In electrodinetic transducers and angular accelerometers
			Solvent in non-aqueous titrations
			Starting material thiamine,acetamidine, etc.
		Organic Chemicals	Solvent in hydrocarbon extraction processes
		Pesticide Manufacturing	Chemical intermediate-pesticide manufacture
		Petroleum Refining	Coloring matter from some petroleum hydrocarbons
		Pharmaceuticals/Medicine	Separation of alkaloids from tissue extraction
U004	Acetophenone	Dyes and Pigments Manufacturing	Solvent for dyes
		Plastics and Resins Manufacturing	Specialty solvent for plastics and resins
		Organic Chemical Manufacturing	Chemical intermediate for the odorant, ethyl methyl phenylglycidate, the riot control agent, 2-chloroacetophenone, 2-bromoacetophenone, for dyes, 3-nitroacetophenone
		Food Processing	Flavoring agent in non-alcoholic beverages, ice cream, candy, baked goods, gelatins, and puddings
		Cosmetics and Fragrances	Fragrance ingredient in soaps, detergents, creams, lotions, and perfumes
		Tobacco	Flavoring in tobacco
U005	2,3-Acetylaminofluorene	Construction	In coal tar for road surfaces and roofing materials

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U005	(continued)		Binder for electrodes in aluminum reduction process
		Pharmaceutical	Treatment of skin disorders
			Waterproofing
			Electrical insulation, pipe coating, sound insulation
		Organic Chemicals Manufacturing	Synthesis of organic chemicals
U006	Acetyl chloride		Catalyst in chlorination of acetic acid
			Production of acetamide
			Production of acetyl sulfide
		Medicine	Testing for cholesterol
			Determination of water in inorganic liquid
			Chemical intermediate acetanilide preparation
			Chemical intermediate acetophenone reparation
		Laboratory	Qualitative organic analysis
		Specialty Chemical	Synthesis of dienestrol diacetate Production of thioacetic acid
			Chlorinating agent inorganic compounds and triarylcarbinols
			Acetylating agent
		Dyes and Pigments	Manufacture dyestuffs
		Pharmaceuticals	Pharmaceuticals manufacturing
U007	Acrylamide		Sewage and waste treatment
			Polyacrylamides manufacturing
			Flocculating aid for precip. suspended solids from aqueous systems
			Flocculants
			Cross-linking agent
		Agricultural Chemicals	In soil-conditioning agents
			In ore processing, adhesives
		Mining	Chemical intermediate in polyacrylamides

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U007	(continued)	Paper and Textile	Paper and textile sizes
		Building & Construction	Construction of dam foundations & tunnels
		Dyes and Pigments	Synthesis of dyes
		Organic Chemicals Manufacturing	Reactive monomer & intermed. organic chemicals production
		Textiles	Permanent press fabrics
U008	Acrylic acid	Organic Chemical Manufacturing	Chemical intermediate for ethyl acrylate, n-butyl acrylate, methyl acrylate, 2-ethylhexyl acrylate, acrylate hydoxyethyl Monomer for polyacrylic acid and salts Comonomer with acrylamide for polymers used as polymers
			Surface coatings
		Textiles	Textile applications
		Cleaning Products	Manufacture of polishes
		Leather and Tanning	Manufacture of leather
		Plastics and Resins Manufacturing	Production of water soluble resins and salts
U009	Acrylonitrile		Chemical intermediate antioxidants synthesis
			In co-polymers with styrene and butadiene
			Chemical intermediate surface-active agents
			Comonomer for starch/acrylonitrile copolymers
		Agricultural Chemicals	Fumigant for mills and commodities (former use)
			Synthetic soil blocks
			Chemical intermediate for acrylamidoaminoethane sulfonic acid
		Plastics	Elastomers for hoses, gaskets & protective clothing
			Chemical intermediate for fatty aminopropylamine & derivs.
			Modifier for natural polymers
			Comonomer for nitrile elastomers
		Water Treatment	In flocculants for water and waste treatment
			Comonomer for alkyd/acrylonitrile copolymers

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U009	(continued)		Organic synthesis to introd. cyanoethyl group
			Comonomer with styrene for urethane polyether polyols
			Chemical intermediate for adiponitrile & acrylamide
		Agricultural Chemicals	Fumigating stored tobacco
		Plastics	In plastics for appliances,automobile interior,boats,RV bodies,etc.
		Paper Manufacturing	Retention aids in papermaking & flotation processes
			Comonomer for barrier resins
		Petroleum	Mobility control agents in crude oil recovery
			Comonomer for acrylic acid
		Adhesive and Sealants	No information available
		Bottling	Bottles for soft drinks (use discontinued)
		Dyes and Pigments	Chemical intermediate dyes
		Textiles and Fibers	To improve the dye and working properties of acrylic fibers Comonomer for acrylic and modacrylic fibers Manufacture of blankets,draperies,upholstery,syn. furs,wigs In apparel,carpeting,home furnishing,sandbags,filter cloths,etc. Cyanoethylation of cotton
		Food Processing	Applied to milling,baking,food processing machinery
		Pesticide Manufacturing	In insecticides Pesticide fumigant for stored grain (former use)
		Pharmaceuticals	Chemical intermediate pharmaceuticals Chemical intermediate for glutethimide (sedative)
		Plastics and Resins	No information available
		Rubber	Manufacturing nitrile rubbers
U010	Mitomycin C	Medicine	Medication
U011	Amitrole	Agricultural Chemicals	Herbicide for non-crop uses (aquatics, hardwood nursery stock) Cotton defoliant Herbicide for food crops (former use) Plant growth regulator
		Photography	Reagent in photography
U012	Aniline		Chemical intermediate for substituted aniline salts

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U012	(continued)		Isocyanate synthesis
			Catalyst and stabilizer for hydrogen peroxide synthesis
			Chemical intermediate for 4-Anilinophenol
			Solvent
			Vulcanization accelerator
			Chemical intermediate for hydroquinone
			Cellulose as a precursor
		Plastics and Resins	Manufacture shoe blacks
			Azeotropic agent in manufact. of anhydrous hydrazine
			Chemical intermediate for methylenediisocyanate
			Manufacture isocyanates for urethane foam
		Explosives	Manufacture explosives
			Manufacture of teryl & optical whitening agents
			Chemical intermediate for corrosion inhibitors
		Agricultural Chemicals	Manufacture herbicides, fungicides
		Cosmetics/Fragrances	Manufacture perfumes
		Dyes and Pigments	Chemical intermediate for dyes & pigments In situ dyeing agent
		Photography	Manufacture photographic chemicals
		Food Processing	In synthesis of intermediates for artificial sweeteners
		Leather and Tanning	Component of skin stains
		Organic Chemicals	Manufacture of rigid polyurethanes
		Plastics and Resins Manufacturing	Component of lacquers & wood stains Chemical intermediate for specialty resins & cyclohexylamine Manufacture resins,varnishes Paint removers
		Paper Manufacturing	Analytical reagent in paper chemistry
		Pesticides Manufacturing	Chemical intermediate for pesticides

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U012	(continued)	Petroleum Refining	No information available
		Pharmaceutical Manufacturing	Chemical intermediate for pharmaceuticals
		Printing	Printing inks,cloth marking inks
		Rubber	Chemical intermediate for rubber processing
U014	Auramine	Dyes and Pigments	Dye for lacquers,pen inks,carbon papers,typewriter ribbons Food dye in some countries Dye for paper,cardboard,textiles,leather,oils,waxes,alcoholic solvents Preparation of solvent yellow 34 Smoke dye
		Pharmaceuticals	Antiseptic
		Agricultural Chemicals	Fungicide
U015	Azaserine	Medicine	Research chemical
		Pharmaceuticals/Medicine	Antineoplastic agent, antibiotic, abortifacient, antifungal
U016	Benz(c)acridine	Construction	In coal tar for road surfaces and roofing materials
			Binder for electrodes in aluminum reduction process
		Pharmaceutical	Treatment of skin disorders
			Waterproofing
			Electrical insulation, pipe coating, sound insulation
		Organic Chemicals Manufacturing	Synthesis of organic chemicals
		Chemical Research	Research chemical
U017	Benzal chloride	Specialty Chemical	Preparation of benzoyl chloride Manufacture of cinnamic acid Chemical intermediate for benzaldehyde
		Dyes and Pigments Manufacturing	In dyes
U018	Benz(a)anthracene	Chemical Research	No commercial use in U.S.
U019	Benzene	Organic Chemicals Manufacturing	Manufacture of styrenes, phenols, cyclohexanes
		Medicine	Manufacture of medicinal chemicals
		Dyes and Pigments	Manufacture of dyes
			Manufacture of artificial leather, linoleum, oil cloth

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U019	(continued)		Manufacture of airplane dopes
		Plastics and Resins	Manufacture of varnishes and lacquers Solvent for waxes, resins, oils, etc.
		Soap	Manufacture of detergents
		Pesticide	Manufacture of pesticides
U020	Benzenesulfonyl chloride	Specialty Chemical	Chemical intermediate for benzonitrile Chemical intermediate for thiophenol Chemical intermediate for glybuzole Chemical intermediate for benzene sulfonamides Chemical intermediate for N-2-chloroethyl amides
		Pesticide	Esters formerly used as insecticides,miticides,fenson acaricide
		Laboratory	Reagent for Freiedl-Crafts sulfonulation
U021	Benzidine	Food	Reagent for hydrogen peroxide in milk
		Paper	Production of security paper
		Sugar	Spray reagent for sugars
		Medicine	Used to verify TLC bands attributed to blood (former use) Stain in microscopy
		Laboratory	Lab agent to detect cyanide & sulfate Quantitative determination of nicotine
		Specialty Chemical	Organic synthesis
		Printing	Used in security printing
			Liquification meadurement
		Plastics	Manufacture of plastic films
		Dyes and Pigments	Chemical intermediate for AZO dyes
		Rubber	Stiffening agent in rubber compounding
U022	Benzo(a)pyrene	Construction	In coal tar for road surfaces and roofing materials
			Binder for electrodes in aluminum reduction process
		Pharmaceutical	Treatment of skin disorders
			Waterproofing

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U022	(continued)		Electrical insulation, pipe coating, sound insulation
		Organic Chemicals Manufacturing	Synthesis of organic chemicals
		Medical Research	Positive control for mutagenicity and carcinogenicity studies
U024	Bis(2-chloroethoxy)methane		Solvent
		Rubber	Chemical intermediate for polysulfide rubber
U025	Dichloroethyl ether	Petroleum Refining	Scavenge lead deposits in gasoline
			Purification of oils
		Agricultural Chemicals	Soil fumigant (former use) Control earworms on corn (former use)
		Organic Chemicals	Chemical intermediate & cross-linker
		Pesticides	Acaricide (former use)
		Pharmaceuticals	Anesthetic
		Textiles	Scouring of textiles
			Used in aerosols
		Lubricant	General/selective solvent production lubricating oils
			In Kier boiling
U026	Chloronaphazine	Medicine	Antineoplastic agent (not in U.S.)
U027	bis-(2-chloroeisopropyl)ether		Chemical intermediate
			In paint and varnish removers
			Spotting and cleaning solutions
			Solvent for fats, waxes, grease
		Textiles	Textile processing
U029	Methyl bromide	Food	Food sterilization Extraction of oils from nuts, seeds, flowers
			Fire extinquisher
			Refrigerant
			In ionization chambers

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U029	(continued)		
		Agricultural Chemicals	Degreasing wool
		Dyes and Pigments	Fumigant for soil
		Pesticides	Solvent in aniline dyes
U030	4-Bromophenyl phenyl ether	Pharmaceuticals	Insect and rodent control in space and commodity fumigations
U031	n-Butyl alcohol	Chemical Research	Methylating agent
		Pharmaceutical Manufacturing	Not in U.S.
		Veterinary Medicine	Manufacture of pharmaceuticals
		Furniture Manufacturing	Bactericide
		Organic Chemical Manufacturing	Solvent for surface coatings
			Chemical intermediate for ethylene glycol, monobutyl ethers, glycol ethers, plasticizers, n-butyl acetate, n-butyl acrylate, butylamines, 2,4-D esters
U033	Carbon fluoride		Dehydrating agent
U034	Trichloroacetaldehyde	Petroleum	Solvent for vegetable oils and alkaloids
			Chemical intermediate in organic synthesis
			Induce swelling of starch granules
			Spraying and pouring of polyurethanes
			Chemical intermediate for chloral hydrate
U035	Chlorambucil	Pesticides	Chemical intermediate for herbicide trichloroacetic acid
			Intermediate in manufacture of DDT,methoxychlor,DDVP,naled,trichlorofon
		Medicine	Not produced in U.S. (imported from U.K.)
U036	Chlordane	Veterinary Medicine	Antineoplastic agent: leukemia,Hodgkins disease,malignant lymphomas,etc.
U037	Chlorobenzene	Pesticide	Antineoplastic agent
U038	Chlorobenzilate	Pesticide	Insecticide
U039	p-Chloro-m-cresol	Pesticide	Manufacture of insecticide
			Acaricide
			External germicide

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U041	n-Chloro-2,3-epoxypropane		Scavenging additive to trichloroethylene
			Preparation of condensates with polyfunctional substances
			Chemical intermediate for glycidyl acrylate and glycidyl methacrylate
			Polymer coating materials in water supply systems
		Plastics and Resins	Reactive plasticizer
			Comonomer for unmodified epoxy resins
			Preparation of ion exchange resins,elastomers,solvents,plasticizers
			Solvent for natural & synthetic resins,gums,cellulose esters & ethers
			Solvent for lacquers,cement for celluloid
			Solvent for paints,varnishes,nail enamels
			Comonomer for polyamide-epichlorohydrin resins
			Raw material for epoxy & phenoxy resins
			Heat stabilizer for plastics
		Paper Manufacturing	High wet-strength resins for paper industry
			Chemical intermediate for polythiols
			Cross-linking agent for hydrogel sheet for temporary wound dressing
			Stabilizer in chlorine-containing material
			Intermediate in the production of beta-blocker, aryloxypropanolamine
			Hair products
			In formation of polythioaldane carboxylic acid oligomers in hair shampoo
			Cross-linking agent for cyclodextrins
			Production of poly(oxlyalkylene)ether derivatives
			Co-stabilizer to enhance mixed-metal combination
			Cross-linking agent in microencapsulation
			Chemical intermediate for alkyl glyceryl ether sulfonate surfactants
			Raw material for glycerol and glycidol derivatives
			Chemical intermediate for glycidyl ethers,glycerin
			Monomer or comonomer in epichlorohydrin elastomers
		Agricultural Chemicals	Sporicide
		Optics	Chemical intermediate for quaternary ammonium salts

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U041	(continued)	Pesticides	Insect fumigant Stable insecticide emulsion
		Pharmaceuticals	Manufacture of pharmaceuticals
		Rubber	Curing propylene-based rubbers
U042	2-Chloroethyl vinyl ether	Fibers	Copolymer with ethyl acrylate to produce acrylic elastomer
U043	Vinyl chloride	Pharmaceuticals	Chemical intermediate for anesthetics, sedatives, & cellulose ethers
		Plastics	Monomer/comonomer for polyvinyl chloride
		Textiles and Fibers	Monomer and comonomer for fibers
			Chemical intermediate
		Adhesive and Sealants Industry	Plastic adhesive
		Automobile Manufacturing	No information available
		Building and Construction	Production vinyl asbestos floor tiles
		Electrical Equipment	Insulation for electrical wire,cable,piping
		Glass	No information available
		Packaging	Food, medical supplies
		Paper	No information available
		Plastics	Organic synthesis of plastics
		Rubber	No information available
U044	Chloroform		Solvent for fats, oils, rubber, alkaloids, waxes, resins
			Cleaning agent
U045	Chloromethane	Rubber	Fire extinquishers
			Manufacturing of methyl cellulose
			Manufacturing of tetramethylead
			Methylating agent
			Propellant
		Agricultural Chemicals	Herbicide Manufacturing of fumigants

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U045	(continued)	Pharmaceuticals	Anesthetic
		Plastics	Foaming agent
		Rubber	Manufacturing of synthetic rubbers Solvent and diluent in butyl rubber production Production of silicone resins and rubbers
		Steel	Foaming agent stainless steel
		Timber	Processing of timber products
			Extractant for oils, fats and resins
			Fluid for thermometric & thermostatic equipment
			Chemical intermediate
			Terminates polymerization of bakelite polysulfone
U046	Chloromethyl methyl ether		Industrial polymers
			Alkylating agent & solvent in manufacture of water repellants
			Intermediate in synthesis of chloromethylated compound
			Preparation of ion-exchange resins
			Chemical intermediate for dodecylbenzyl chloride
U047	2-Chloronaphthalene		No information available
U048	2-Chlorophenol		No information available
U049	4-Chloro-o-toluidine hydrochloride	Dyes and Pigments	Produce AZO dyes for cotton,silk,acetate,nylon Chemical intermediate for dyes
U050	Chrysene	Construction	In coal tar for road surfaces and roofing materials
			Binder for electrodes in aluminum reduction process
		Pharmaceutical	Treatment of skin disorders
			Waterproofing
			Electrical insulation, pipe coating, sound insulation
		Organic Chemicals Manufacturing	Synthesis of organic chemicals
		Chemical Research	Research chemical
U051	Creosote	Medicine	Antipyretic, styptic, astringent

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U051	(continued)		Lubricant for die molds
		Plastics and Resins	Waterproofing agent
		Veterinary Medicine	Parasiticide, deodorant
		Pharmaceutical	External antiseptic, disinfectant, expectorant, local anesthetic, gastric sedative
		Wood Preserving	Preservative
U052	Cresols	Agricultural Chemicals	Herbicide manufacturing
U053	Crotonaldehyde	Organic Chemical Manufacturing	Chemical intermediate for 2-ethylhexyl alcohol
		Plastics and Resins Manufacturing	Solvent for polyvinyl chloride
		Tire	Preparation of rubber accelerators
		Petroleum Refining	Purification of lubricating oils
		Agricultural Chemical Manufacturing	Manufacture of insecticides
		Military	Manufacture of tear gas
		Organic Chemical Manufacturing	Organic synthesis
		Leather and Tanning	Leather tanning
U055	Cumene (Isopropylbenzene)	Organic Chemicals Manufacturing	Manufacture of phenol, acetone, acetophenone, a-methylstyrene
U056	Cyclohexane	Plastics and Resins	Solvent for lacquers and resins
		Paint	Paint and varnish remover
			Extraction of essential oils
		Laboratories	Molecular weight determination
		Organic Chemicals Manufacturing	Manufacture of adipic acid, benzene, cyclohexyl chloride, nitrocyclohexane, cyclohexanol, cyclohexanone
		Petroleum Refining	Manufacture of solid fuel for camp stoves
			In fungicidal formulations
			In recrystallization of steroids
U057	Cyclohexanone	Organic Chemical Manufacturing	Chemical intermediate in synthesis of caprolactam
		Plastics and Resins Manufacturing	Solvent for lacquers, wood stains, paint, and varnish removers

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U057	(continued)		Solvent for polyvinyl chloride and its copolymers
		Leather and Tanning	Spot remover and degreaser for leather
U059	Daunomycin	Pharmaceuticals	Antineoplastic agent, antibiotic (not produced in U.S.)
U060	DCD	Pesticide	Nonsystemic contact and stomach insecticide
U061	DDT	Pesticide	Nonsystemic contact and stomach insecticide
U062	Diallate	Agricultural Chemicals	Sprout inhibitor Herbicide
U063	Dibenzo(a,h)anthracene	Construction	In coal tar for road surfaces and roofing materials
			Binder for electrodes in aluminum reduction process
		Pharmaceutical	Treatment of skin disorders
			Waterproofing
			Electrical insulation, pipe coating, sound insulation
		Organic Chemicals Manufacturing	Synthesis of organic chemicals
U064	1,2,7,8-Dibenzopyrene	Construction	In coal tar for road surfaces and roofing materials
			Binder for electrodes in aluminum reduction process
		Pharmaceutical	Treatment of skin disorders
			Waterproofing
			Electrical insulation, pipe coating, sound insulation
		Organic Chemicals Manufacturing	Synthesis of organic chemicals
		Medical Research	Experimental carcinogen
U066	1,2-Dibromo-3-chloropropane		Intermediate in organic synthesis
			Commercial preparation for flame retardant
		Agricultural Chemicals	Soil fumigant for pineapple in Hawaii
U067	Ethylene dibromide	Agricultural Chemicals	Quarantine fumigant some fruits & veg.
		Plastics and Resins	Solvent for resins,gums,waxes
			Chemical intermediate and in gauge fluids
			Vault fumigation

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U067	(continued)		Catalyst in preparation of Grignard reagents
			Chemical intermediate for vinyl bromide
		Dyes and Pigments	Chemical intermediate for dyes
		Food Processing	Spot fumigation milling machinery
		Pesticides	Termite and japanese beetle control Insecticidal fumigant for stored products Beehive supers Soil treatment (insects and nematodes)
		Pharmaceuticals	Chemical intermediate for pharmaceuticals
		Timber	Felled log fumigation
U068	Dibromomethane		Organic synthesis
			Gauge fluid
			Ingredient of fire-estinquishing fluids
			Heavy liquid in solid separations
		Plastics and Resins	Solvent for waxes & resins
U070	1,2-Dichlorobenzene	Pesticide	Fumigant and insecticide
U071	1,3-Dichlorobenzene		No information available
U072	1,4-Dichlorobenzene	Pesticide	Manufacture of moth repellant, soil fumigant
U073	3,3'-Dichlorobenzidine		Curing agent
		Dyes and Pigments	Paint and ink formulation Manufacture of AZO dyes Chemical intermediate for dyes
		Plastics	Plastic compounding ingredient
		Rubber	Rubber compounding ingredient
U074	1,4-Dichloro-2-butene	Organic Chemicals Manufacturing	Chemical intermediate for hexamethylenediamine and chloroprene
		Pesticide	Nematocides and as chemical intermediate
U075	Dichlorodifluoromethane	Health and Safety	Leak-detecting agent
			Refrigerant

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U075	(continued)	Plastics	Polymerization catalyst
		Adhesive and Sealants Industry	Aerosol propellent
		Agricultural Chemicals	Aerosol propellent
		Automobile Manufacturing	Refrigerant for air conditioning
		Bottle Manufacturing	No information available
		Cosmetics Manufacturing	Aerosol propellent
		Electrical Equipment	Manufacturing electrical insulation and generator windings
		Food Processing	Solvent or diluent in fumigants for food sterilization
		Food Processing	Freezing of foods
		Food Service/Restaurant	Chilling of glasses
		Medicine	Preparation of frozen tissue sections
		Metals Manufacturing	Copper and aluminum purification
		Organic Chemicals	Synthesis of Freons
		Paint Manufacturing and Application	Used in paints & varnish removers
		Paint Manufacturing and Application	Aerosol propellant
		Petroleum Refining	Petroleum recovery
		Pharmaceutical Manufacturing	Aerosol propellant
			Refrigerant in home & commercial applications
		Plastics	Used in polymerization process
			Aerosol propellant in cleaners
			Working fluid for heat pumps and in hydraulic fluids
			Foaming agent for surfactants
			Foaming agent in fire extinquishers
			Water purification
			Used in thermal expansion valves
U076	1,1-Dichloroethane	Organic Chemicals Manufacturing	Chemical intermediate for vinyl chloride, 1,1,1-trichloroethane

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U077	1,2-Dichloroethane		Solvent for fat and oils
		Plastics and Resins	Solvent for waxes, gum, resins
			Fumigant
U078	1,1-Dichloroethylene	Organic Chemicals Manufacturing	Intermediate for vinilydene polymer plastics
U079	1,2-Dichloroethylene		Solvent for fats, phenol, camphors
U080	Methylene chloride		Solvent for cellulose acetate
			Degreasing and cleaning fluids
		Food Processing	Solvent
U081	2,4-Dichlorophenol	Organic Chemicals Manufacturing	Organic synthesis
U082	2,6-Dichlorophenol	Pesticide	Systemic herbacide
U083	1,2-Dichloropropane		Oil and fat solvent
		Dry Cleaning	In dry cleaning fluids
			In degreasing
		Pesticide	Insecticidal fumigant mixtures
U084	1;3-Dichloropropene		Oil and fat solvent
		Dry Cleaning	In dry cleaning fluids
			In degreasing
		Pesticide	Insecticidal fumigant mixtures
U085	1,2:3,4-Diepoxybutane	Commercial Testing Laboratories	Research chemical
U089	Diethylstilbestrol	Pharmaceuticals/Medicine	No longer used
U090	Dihydrosafrole		Chemical intermediate for piperonyl butoxide (not in U.S.)
		Flavor	Flavoring agent in root beer
		Cosmetics and Fragrances	Fragrance for cosmetics
U091	3,3'-Dimethoxybenzidine		Detection of thiocyanates, nitrites, & some metals
		Tanning, Paper, Rubber, Textiles	Dye
			Chemical intermediate in production of O-dianisidine diisocyanate

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U091	(continued)	Dyes and Pigments	Chemical intermediate in dyes and pigments
U092	Dimethylamine		Reagent for magnesium
			Missile fuel
		Dyes and Pigments	Dyes
			Ion exchange agent
			Chemical intermediate for lauryl dimethylamine oxide
		Detergents	Manufacture of detergents
			Surfactant
		Pharmaceuticals	No information available
		Petroleum Refining	Antiknock agent in fuels Gasoline stabilizer
		Agricultural Chemicals	Attract boll weevils
			Antioxidants
			Dehairing agent
		Textiles	Textile chemicals
			Electroplating
			Acid gas absorbent
			Flotation agent
		Pesticides	Pesticide propellant
			Chemical intermediate for dimethylformamide,dimethylacetamide
		Plastics and Resins	Plasticizer
			Rocket propellant
			Dimethylamine salt of 2,4-D
		Film	Photographic chemical
		Leather and Tanning	Tanning
		Rubber	Accelerator in vulcanizing rubber
U093	p-Dimethylaminoazobenzene		Not produced or used in U.S.

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U094	7,12-Dimethylbenz(a)anthracene	Construction	In coal tar for road surfaces and roofing materials
			Binder for electrodes in aluminum reduction process
		Pharmaceutical	Treatment of skin disorders
			Waterproofing
			Electrical insulation, pipe coating, sound insulation
		Organic Chemicals Manufacturing	Synthesis of organic chemicals
		Medical Research	Induces malignant tumors in testing of antineoplastic drugs
U095	3,3'-Dimethylbenzidine		Free chlorine in water
			Reagent for gold detection
			In chlorine test kits & test tapes in clinical laboratories
		Dyes and Pigments	Chemical intermediate for AZO dyes
		Plastics and Resins	Curing agent for urethane resins
U097	Dimethyl carbonyl chloride		Chemical intermediate for parasympathomimetic agents
		Pesticides	Pesticide (former use)
U101	2,4-Dimethyl phenol	Pesticide	Insecticide, fungicide
U105	2,4-Dinitrotoluene	Dyes and Pigments	Chemical intermediate for dyes
			Production of toluenediamine (Ramey nickel slurry process)
			Chemical intermediate in production of toluene diisocyanate
		Explosives	Added to sensitizing materials in dynamite Plasticizer in moderate and high explosives Gelatinizing & waterproofing agent Explosives intermediate
		Munition	Modifier for smokeless powders
		Plastics and Resins	Plastics manufacture
		Rubber	Rubber chemical
U106	2,6-Dinitrotoluene		Chemical intermediate for toluene-2,2-diamine
			Synthesis of urethane polymers, flexible & rigid foams

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U106	(continued)	Dyes and Pigments	In dyes
		Explosives	In synthesis of TNT Gelatinizing and waterproofing agent in explosives
		Plastics and Resins	Surface coatings
U108	1,4-Dioxane	Cosmetics and Fragrances	Manufacture of cosmetic products
		Paint Manufacturing	Manufacture of lacquers, paints, varnishes, paint
		Paper Processing	Solvent in pulping of wood
		Dyes and Pigments Manufacturing	Wetting and dispersing agent in textile processing, dye-baths, stain and printing compositions
		Cleaning Products	Manufacture of cleaning and detergent preparations, adhesives, fumigants, emulsions, and polishing compositions
		Organic Chemical Manufacturing	Solvent for fats, oils, waxes
		Plastics and Resins Manufacturing	Solvent for natural and synthetic resins
U110	Dipropylamine		Purification of perfluoro-compounds
			Chemical intermediate for S-propyl-di-n-propylthiocarbamate
		Agricultural Chemicals	Chemical intermediate for herbicide S-ethyl-di-n-propylthiocarbamate
U111	Di-n-propylnitrosamine		Research chemical
U112	Ethyl acetate	Organic Chemical Manufacturing	Organic synthesis
		Medicine	Carminative, antispasmodic, and counterirritant
			Component of base sheet (cellophane)
		Food Processing	Diluent in inks for marking fruits and vegetables, synthetic flavoring
		Plastics and Resins Manufacturing	Solvent for plastics
		Printing	Solvent for inks
		Paint Manufacturing	Solvent for varnishes, lacquers
		Munitions	Manufacture of smokeless powder
		Film	Manufacture of photographic films and plates

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U112	(continued)	Leather and Tanning	Manufacture of artificial leather
		Cosmetics and Fragrances	Manufacture of perfumes and fragrances
U113	Ethyl acrylate	Paint Manufacturing	Emulsion polymers for trade sale paints
		Textiles	Textile coating and printing
		Paper Coating	Paper coatings
		Cleaning Products	Floor finishes
		Adhesives and Sealants	Emulsion polymers for adhesives and sealants
		Leather and Tanning	Leather finishes
		Food Processing	Synthetic flavorings
U114	Ethylene bis-dithiocarbamic acid	Agricultural Chemicals	Heavy metal salts as fungicides
U116	Ethylene thiourea		Electroplating baths
			Intermediate for antioxidants
		Agricultural Chemicals	Intermediate for fungicides
		Dyes and Pigments	Intermediate for dyes
		Pesticides	Intermediate for insecticides
		Pharmaceuticals	Intermediate for pharmaceuticals
		Plastics and Resins	Manufacture of synthetic resins
		Rubber	Accelerator for neoprene rubbers
U117	Diethyl ether	Organic Chemical Manufacturing	Solvent for waxes, fats, and oils
			Reagent for organic synthesis
			Chemical intermediate for monoethanolamine, ethylene
		Cosmetics and Fragrances	Solvent for perfumes
		Explosives	Manufacture of gun powder
		Automotive	Primer for gasoline engines
		Commercial Testing Laboratories	Extractant of hormones from plant and animal tissues
		Veterinary Medicine	Inhalation anesthetic, antispasmodic, rubefacient

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U118	Methacrylic acid, ethyl ester	Plastics and Resins Manufacturing	Comonomer in acrylic polymers for surface coating resins
		Cleaning Products	Acrylic emulsion polymers for polishes
		Pharmaceutical Manufacturing	Comonomer in denture base material
U119	Ethyl methane sulfonate	Biochemical Research	Not produced in U.S.
U120	Fluoranthene	Construction	In coal tar for road surfaces and roofing materials
			Binder for electrodes in aluminum reduction process
		Pharmaceutical	Treatment of acute and chronic dermatoses
			Waterproofing
			Electrical insulation, pipe coating, sound insulation
		Organic Chemicals Manufacturing	Synthesis of organic chemicals
			In lining for steel and ductile iron potable water pipes and storage tanks
		Chemical Research	Research chemical
U121	Fluorotrichloromethane		Sulfonation solvent in chemical synthesis
			Dielectric fluid in bubble chambers in wind tunnels
			Aerosol propellant
			Blowing agent in production of polyurethane foam
			Production of polymeric resins
			Chemical intermediate
		Agricultural Chemicals	Aerosol propellant
		Cosmetic and Fragrance	Aerosol propellant
		Electrical Equipment	Electric insulation
		Food Processing	No information available
		Organic Chemicals	Manufacture cleaning compounds
		Paint Manufacturing and Application	Aerosol propellant
		Pharmaceuticals	Aerosol propellant
			Manufacture fire extinquishers

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U121	(continued)		Aerosol propellant (floor waxes)
			Refrigerant
			Solvent and degreasing agent
U122	Formaldehyde	Plastics and Resins Manufacturing	Chemical intermediate for phenolic, polyacetal and melamine resins
			Chemical intermediate for resorcinol-formaldehyde and aniline-formaldehyde resins
		Organic Chemical Manufacturing	Chemical intermediate for acetylenic chemicals, (1,4-butanediol), polyols (pentaerythritol), hexamethylenetetramine, methylene dianiline, pyridine chemicals, nitroparaffin derivatives
		Tire	Chemical intermediate for rubber processing chemicals
		Medicine	Disinfectant
			Embalming agent
		Dyes and Pigments Manufacturing	Component of dyes as starch preservative
		Leather and Tanning	Chemical intermediate for synthetic tanning agent
		Explosives	Chemical intermediate for explosives
		Agriculture	Soil sterilant in mushroom houses before planting
U123	Formic acid	Agricultural Chemical Manufacturing	Manufacture of fumigants, insecticides
		Paint Manufacturing	Manufacture of commercial paint strippers, lacquers
		Textiles	Dyeing and finishing of textiles
		Organic Chemical Manufacturing	Preparation of organic esters
			Manufacture of refrigerants
		Cosmetics and Fragrances	Solvent for perfumes
		Medicine	Antiseptic
			Silvering glass
		Fiber Manufacturing	Cellulose formate
			Ore floatation

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U123	(continued)	Plastics and Resins Manufacturing	Manufacture of vinyl resin plasticizers
		Leather and Tanning	Leather tanning
U124	Furan	Organic Chemical Manufacturing	Chemical intermediate for tetrahydrofuran
			Organic synthesis for pyrrole, thiophene
U125	Furfural	Organic Chemical Manufacturing	Solvent in extraction of butadiene from C4 streams
		Petroleum Refining	Refining of lubricating oils
		Adhesives and Sealants	Constituent of rubber cement
		Food Processing	Synthetic flavoring ingredient
		Plastics and Resins Manufacturing	Solvent for synthetic and natural resins
		Medicine	Screening test for urine
		Paint Manufacturing	Manufacture of varnishes
		Agricultural Chemical Manufacturing	Insecticide, fungicide, germicide
		Automotive	Wetting agent in the manufacture of abrasive wheels and brake linings
U126	Glycidylaldehyde	Commercial Testing Laboratories	Research chemical
		Wool Weaving and Finishing	Cross-linking agent for finishing of wool
		Leather and Tanning	Oil tanning and fat-liquoring of leather
		Medicine	Oil tanning and fat-liquoring of surgical sutures
			Protein insolubilization
			Chemical intermediate in glycerol manufacture
U127	Hexachlorobenzene	Pesticide	Fungicide
U128	Hexachlorobutadiene	Rubber	Solvent for rubber
U129	Lindane	Pesticide	Insecticide
U130	Hexachlorocyclopentadiene	Pesticide Manufacturing	Chemical intermediate for aldrin, dieldrin, endrin, endosulfan, chlordane, heptachlor, isodrin
U131	Hexachloroethane		Solvent
		Explosive	Explosives

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U131	(continued)		Camphor substitute in celluloid
		Rubber	Vulcanizing accelerator
U132	Hexachlorophene	Soap	In soap and germicidal preparations
		Cosmetics	In cosmetic preparations
U137	Ideno(1,2,3-c,d)pyrene	Construction	In coal tar for road surfaces and roofing materials
			Binder for electrodes in aluminum reduction process
		Pharmaceutical	Treatment of acute and chronic dermatoses
			Waterproofing
			Electrical insulation, pipe coating, sound insulation
		Organic Chemicals Manufacturing	Synthesis of organic chemicals
		Chemical Research	Research chemical
U138	Iodomethane		Chemical intermediate for methylamines & quarternary ammonium iodides
			Chemical intermediate for for phosponium iodides
			Chemical intermediate for organometallics
			Alkylating agent
		Pharmaceuticals	Methylating agent in prep. pharmaceutical intermediates
			Microscopy
			Building block for radioactive tracers synthesis
			Testing for pyridine
			As imbedding material of diatom examination
			As fire extinquisher
U140	Isobutyl alcohol	Food Processing	Manufacture of food additives
		Plastics and Resins Manufacturing	Solvent for surface coatings and adhesives
			Chemical intermediate for isobutyl esters used as plasticizers
		Cosmetics and Fragrances	Manufacture of perfumes
		Pharmaceutical Manufacturing	Processing solvent for pharmaceuticals

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U140	(continued)	Agricultural Chemical Manufacturing	Processing solvent for pesticides
		Organic Chemical Manufacturing	Chemical intermediate for isobutylamines, zinc diisobutyldithiophosphate, isobutyl acetate, acrylate and methacrylate esters
			Diluent-reagent in the alkylation of amino resins
		Petroleum Refining	Cosolvent in tertiary oil recovery
			Chemical intermediate for isobutyl esters used as plasticizers
U141	Isosafrole	Flavor	In root beer (former use) and sarsaparilla flavors
			Manufacture heliotropin
			Chemical intermediate for dihydrosafrole (not in U.S.)
			Manufacture pesticide synergists
		Cosmetic and Fragrance	Modify oriental perfumes
U143	Lasiocarpine	Medicine	Research chemical
U147	Maleic anhydride	Organic Chemical Manufacturing	Diene syntheses, co-polymerization reactions
			Chemical intermediate for fumaric acid, malic acid
			Chemical intermediate for surfactants, chlorendic anhydride and acid, rosin adducts
		Plastics and Resins Manufacturing	Manufacture of alkyd-type resins, reactive plasticizers
			Comonomer for unsaturated polyester resins
		Dyes and Pigments Manufacturing	Manufacture of dye intermediates
		Pharmaceutical Manufacturing	Manufacture of pharmaceuticals
		Agricultural Chemical Manufacturing	Manufacture of agricultural chemicals
		Petroleum Refining	Chemical intermediate for lube oil dispersants and corrosion inhibitors
U148	Maleic anhydride		Synthesis of pyridazine
			Uracil antimetabolite
		Agricultural Chemicals	Weed control in mixture with 2,4-D Inhibits plant growth (tobacco, potato & onions)

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U148	(continued)		Sugar content stabilizer in beets Fungicidal
U149	Malonitrile		Photosensitizer
		Medicine	Formerly used to treat mental illness
			Acrylic fiber and dyestuff synthesis
			Organic synthesis
		Lubricant	Lubricating oil additive
			Leaching agent for gold
		Medicine	Thiamine synthesis
		Medicine	Anti-cancer agent synthesis
U150	Melphalan	Medicine	Antineoplastic agent
U152	Methacrylonitrile		Preparation of homopolymers & copolymers
			Intermediate in preparation of acids, amides, amines, esters, nitriles
			Monomer for copolymers
			Monomer for polymethacrylonitrile
		Plastics and Resins	Manufacture of elastomers, coatings, plastics
U153	Methanethiol	Flavor	Synthetic flavoring and adjuvants
			Synthesis of methimine
			Synthetic flavoring substances and adjuvants
			Catalyst
			Gas odorant for hazardous gases
			Synthesis of methimine
		Agricultural Chemicals	Intermediate in fungicides
		Pesticides	Intermediate in pesticide manufacture
		Petroleum Refining	Intermediate in jet fuels manufacture
		Plastics and Resins	Intermediate in plastics manufacture
U154	Methyl alcohol		Kill animal pathogenic bacteria and maggots on

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U154	(continued)		household contents, mortuary instruments, human bedding and clothing, tissues, human stools, and cadavers
		Agricultural Chemicals	Treatment against onion smut, dutch elm disease, and wood root Removal of toxic organic pollutants from soil
		Petroleum Refining	Kill slime forming bacteria in oil recovery injection water and packer fluid
		Printing	Duplicating fluid
			Removal of 2,4-dinitrotoluene from spent carbons
U155	Methapyrilene	Pharmaceuticals	Sedative in sleeping aids Antihistaminic
		Veterinary Medicine	Antihistaminic agent
U156	Methyl chlorocarbonate		In organic synthesis
		Pesticides	In insecticides
U157	3-Methylcholanthrene	Construction	In coal tar for road surfaces and roofing materials
			Binder for electrodes in aluminum reduction process
		Pharmaceutical	Treatment of acute and chronic dermatoses
			Waterproofing
			Electrical insulation, pipe coating, sound insulation
		Organic Chemicals Manufacturing	Synthesis of organic chemicals
		Medical Research	Induces specific forms of cytochrome in cancer research
U158	4,4-Methylene-bis-(2-chloroaniline)		Components in home appliances
			Manufacture of radar systems
		Munitions	Manufacture of gun mounts
		Aircraft	Manufacture of jet engine turbine blades
		Plastics and Resins Manufacturing	Curing agent
U159	Methyl ethyl ketone	Paint Manufacturing	Manufacture of paint removers
		Cement	Manufacture of cements

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U159	(continued)	Adhesives and Sealants	Manufacture of adhesives
			Solvent for adhesives
		Cleaning Products	Cleaning fluids
		Organic Chemical Manufacturing	Organic synthesis
			Oxidation promoter in manufacture of terephthalic acid from p-xylene
		Building Products	Solvent for coatings
		Magnetic Tape	Solvent for magnetic tape
		Printing	Solvent for printing inks
		Agricultural Chemical Manufacturing Medicine	Solvent for cosolvent in pesticide formulations Sterilizer for baterial spores on surgical instruments, hypodermic needles/syringes, and dental instruments
U161	Methyl isobutyl ketone	Pharmaceutical Manufacturing	Denaturant for rubbing alcohol Manufacture of antibiotics
		Paint Manufacturing	Solvent for paints, varnishes, cellulose lacquer Manufacture of methyl amyl alcohol
		Organic Chemical Manufacturing	Organic synthesis, extraction processes
		Dry Cleaning	Manufacture of dry cleaning preparations
		Food Processing	Manufacture of synthetic flavoring substances
U162	Methyl methacrylate	Organic Chemical Manufacturing	Monomer for polymethyl methacrylate, comonomer for copolymers
			Chemical intermediate for higher methacrylate esters
U163	N-Methyl,N-nitro-,N-nitroguanidine		Laboratory preparation of diazomethane (former use)
		Medicine	Research chemicals
U164	Methylthiouracil	Human/Veterinary Medicine	Anti-thyroid agent (Not produced in U.S.)
U165	Naphthalene	Organic Chemicals Manufacturing	Manufacture of phthalic and anthranilic acids, naphthols, naphthylamines, sulfonic acid
		Plastics and Resins	Manufacture of synthetic resins
			Manufacture of celluloid, lampblack, smokeless powder
			Preparation of anthiaquinone

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U165	(continued)	Dyes and Pigments	Manufacture of indigo
			Formation of perylene
		Pesticide	Chemical intermediate for 1-naphthyl-n-methyl carbamate insecticide
		Leather and Tanning	Chemical intermediate for beta-naphthol and synthetic tanning chemicals
			Chemical intermediate for naphthalene sulfactants
		Veterinary Medicine	Insecticide, antiseptic, vermicide
			Ingredient in moth repellant and toilet bowl deodorants
			Manufacture of hydronaphthalenes used as solvents in lubricants and motor fuels
U166	1,4-Naphthoquinone	Tire	Polymerization regulator for rubber
		Plastics and Resins Manufacturing	Polymerization regulator for polyester resins
		Dyes and Pigments Manufacturing	Synthesis of dyes
		Pharmaceutical Manufacturing	Synthesis of pharmaceuticals
		Agricultural Chemical Manufacturing	Algicide
U167	1-Naphthylamine		Chemical intermediate for imidazoline adrenergic agent
			Chemical intermediate for N-1-Naphthylphthalmic acid herbicide
			Toning prints made with cerium salts
		Dyes and Pigments	Chemical intermediate for dyes
		Pesticides	Chemical intermediate for 1-Naphthylthiourea rodenticide (former use)
		Pesticides	Chemical intermediate for fluoroacetamide miticide (former use)
		Rubber	Chemical intermediated for N-Phenyl-1-Naphthylamine rubber antioxidant
U168	2-Naphthylamine		Production 2-chloronaphthylamine
		Dyes and Pigments	Former chemical intermediate for dyes
		Rubber	Former chemical intermediate for rubber antioxidants
		Rubber	Formerly in manufacture of rubber
U169	Nitrobenzene		Solvent

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U169	(continued)	Jewelry	Ingredient of metal polishes
			Manufacture pyroxylin compound
		Plastics and Resins	Preservative in spray paints
			Solvent for cellulose ethers
			Chemical intermediate for aniline, dichloroanilines
			Refining lubricating oils
			In soaps, shoe polishes
		Food	Substitute for almond essence
			Production of isocyanates
			Modifying esterification of cellulose acetate
			Constituent of floor polishes
		Pesticides	Production of pesticides
		Pharmaceuticals	Production of pharmaceuticals (acetominophen)
		Rubber	Production of rubber chemicals
U170	4-Nitrophenol	Pesticide	Production of parathion, fungicide
U171	2-Nitropropane	Paint and Varnish	Paint and varnish removal
			Chemical intermediate for 2-Amino-2-methyl-1-propanol
			Increase wetting ability & electrostatic spraying properties
			Solvent for chemical reactions
			Provide better flow characteristics & film integrety
			Chemical synthesis
		Dyes and Pigments	Insure greater pigment dispersion
			Co-solvent for coatings, ink, & adhesives
			Insure more complete solvent release
		Munitions	Rocket propellant
			Improve drying time in solvent systems

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U171	(continued)		Processing solvent for extractions and separations
		Coating	Acid-proof lacquer on battery cases
		Coating	Solvent systems
		Dyes and Pigments	Intermediate in synthesis of dyes
		Pesticides	Intermediate in synthesis of insecticides
		Petroleum Refining	Racing car fuel Gasoline additive Smoke depressant in diesel fuel
		Pharmaceuticals	Intermediate in synthesis of pharmaceuticals
U172	N-Nitroso-di-n-butylamine	Research	Research chemical
U173	N-Nitroso-diethanolamine	Research	Researh chemical
U174	N-Nitrosodiethylamine	Research	Research chemical
			Stabilizer
			Antioxidant
		Petroleum Refining	Gasoline and lubricant additive
U176	N-Nitroso-N-ethylurea	Research	Research chemical
			Laboratory preparation of diazoethane
U177	N-Nitroso-N-methylurea		Mutagenic effects on various plants
			Laboratory synthesis of diazomethane
U178	N-Nitroso-N-methylurethane		Laboratory synthesis of diazomethane
		Research	Research chemical
U179	N-Nitrosopiperidine	Research	Research chemical
U180	N-Nitrosopyrrolidine	Research	Research chemical
U181	5-Nitro-o-toluidine	Dyes and Pigments	Chemical intermediate for pigments and dyes
U182	Paraldehyde	Organic Chemical Manufacturing	Substitute for acetaldehyde
			Solvent for fats, oils, waxes
		Dyes and Pigments Manufacturing	Manufacture of dyestuff intermediates

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U182	(continued)	Plastics and Resins Manufacturing	Solvent for gums, resins
		Leather and Tanning	Manufacture of leather
		Fiber Manufacturing	Mixtures for cellulose derivatives
U183	Pentachlorobenzene		No information available
U184	Pentachloroethane		Solvent for oil and grease in metal cleaning
		Coal	Separation of coal from impurities
		Agricultural Chemicals	Soil sterilization
		Organic Chemicals Manufacturing	Solvent for cellulose acetate, cellulose esthers, resins
		Lumber	Drying agent for timber
U185	Pentachloronitrobenzene	Agricultural Chemical	Fungicide
U186	1,3-Pentadiene		Manufacture of synthetic rubber
U187	Phenacetin	Hair Products	Stabilizer for hydrogen peroxide in hair bleaching preparation
		Pharmaceuticals/Veterinary Medicine	Analgesic and antipyretic
U188	Phenol		Disenfectant
U191	2-Picoline		Chemical intermediate for 2-chloro-6-(trichloromethyl)pyridine
			Organic intermediate for pharmaceuticals,rubber chemicals
			Chemical intermediate for 2-vinylpyridine, herbicide picloram,amprolium
		Dyes and Pigments	Intermediate
		Plastics and Resins	Intermediate
U192	Pronamide	Agricultural Chemical	Herbicide for vegetables
U193	1,3-Propane sulfone		Confer water solubility and anionic character
			Chemical intermediate to sulfopropyl group
U194	n-Propylamine	Textiles	Chemical intermediate for textile resins
			Chemical intermediate for propyl isocyanate
		Dyes and Pigments	Chemical intermediate for dyes
		Pesticides	Chemical intermediate for pesticides

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U194	(continued)	Petroleum Refinining	Chemical intermediate for petroleum additives
		Pharmaceuticals	Chemical intermediate for drugs
		Rubber	Chemical intermediate for rubber chemicals
U196	Pyridine		Solvent reaction medium or catalyst in carbohydrate treatment
			In organic synthesis and analytical chemistry
			As an inhibitor & preparation of inhibitor
		Pharmaceuticals	Manufacture vitamins,sulfa drugs,disinfectants Chemical intermediate for antihistamines Manufacture of stimulants,local anesthetics
			Solvent in drug manufacture
			Chemical intermediate for diquat & paraquat, piperidine
			Solvent for anhydrous mineral salts
			To denature alcohol & antifreeze mixtures
			Reduces nitrogen oxide in flue gas
			Synthesis of piperidine
			Reagent
		Agricultural Chemicals	Manufacture fungicides
		Dyes and Pigments	Manufacture dyestuffs
		Explosives	Manufacture explosives
		Food Products	Useful in seafood, smoke falvor, chocolate
		Paint Manufacturing	Solvent reaction medium or catalyst in paint manufacture
		Petroleum Refining	In oil and gas well drilling
		Plastics and Resins	Solvent in manufacture of polyurethane resins
		Rubber	No information available
		Textiles	Chemical intermediate for water-proofing agents in textiles
U197	1,4-Benzoquinone	Agricultural Chemical Manufacturing	Manufacture of fungicides

TABLE A-1 (Continued,

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U197	(continued)	Organic Chemical Manufacturing	Analytical reagent, oxidizing agent
			Determination of amino acids by the formation of red charge-transfer complexes
		Film	Photography
		Leather and Tanning	Tanning hides
		Cosmetics and Fragrances	Transform nitrogen containing-compounds into colored substances
U200	Reserpine	Pharmaceuticals	Medication
U201	Resorcinol	Leather and Tanning	In tanning
		Explosives	
		Dyes and Pigments	
		Plastics and Resins	Manufacture of resins
U202	Saccharin	Animal Food Products	Cattle feed additive
		Electroplating	Electroplating bath additive
		Food Products	Non-caloric synthetic sweetener -- food, gum, toothpaste, smokeless tobacco, etc.
U203	Safrole		Chemical intermediate for heliotropin
			Chemical intermediate ofr isosafrole
			Manufacture of piperonyl butoxide
		Adhesives and Sealants	As preservative in mucilage and library paste
		Cosmetics	Fragrance for cosmetics
		Pesticides	Pediculicide
		Pharmaceuticals	Flavoring agent for drugs, topical antiseptic Carminative
U206	Streptozatocin	Medicine	Antineoplastic agent in cancer treatment Experimental use in diabetes & as antimicrobial agent
		Veterinary Medicine (Research)	Diabetogenic agent
U207	1,2,4,5-Tetrachlorobenzene		No information available

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U208	1,1,1,2-Tetrachloroethane		Nonflammable solvent for fats, oils, waxes, resins, cellulose acetate, rubber, phosphorous, sulfur
		Plastics and Resins	Manufacture of paint, varnish, and rust removers
		Agricultural Chemicals	Soil sterilization, weed killer, and insecticide formulations
			Immersion fluid in crystallography
		Medical Research	Provide pathological changes in gastrointestinal tract, liver, kidneys
		Organic Chemicals Manufacturing	Chemical intermediate for trichloroethylene, halogenated hydrocarbons
U209	1,1,2,2-Tetrachloroethane		Nonflammable solvent for fats, oils, waxes, resins, cellulose acetate, rubber, phosphorous, sulfur
		Plastics and Resins	Manufacture of paint, varnish, and rust removers
		Agricultural Chemicals	Soil sterilization, weed killer, and insecticide formulations
			Immersion fluid in crystallography
		Medical Research	Provide pathological changes in gastrointestinal tract, liver, kidneys
		Organic Chemicals Manufacturing	Chemical intermediate for trichloroethylene, halogenated hydrocarbons
U210	Tetrachloroethylene	Dry Cleaning	
			Degreasing metals
			Solvent
U211	Carbon tetrachloride		Fire extinquisher
		Dry Cleaning	Cleaning clothing
		Automobile	Azeotropic drying agent for wet spark plugs
			Solvent for oils, fats, lacquers, varnishes, rubber, waxes, resins
			Extracting oil from flowers, seeds
		Pesticide	Insecticide
		Organic Chemicals Manufacturing	Starting material for organic compounds
U213	Tetrahydrofuran	Food Processing	Indirect food additive for food contact surface of articles intended for use in food processing
		Plastics and Resins Manufacturing	Solvent for resins and plastics
		Organic Chemical Manufacturing	Chemical intermediate for polytetramethylene

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U213	(continued)		glycol, tetrahydrothiophene
		Magnetic Tape	Solvent for top coating solutions, protective coatings, coating magnetic tapes
		Cleaning Products	Solvent for cleaning
			Agent in liquid membrane electrode manufacturing
			Polymerization solvent
		Printing	Solvent for print inks
			Solvent for production of tetraethyl and tetramethyl lead
U218	Thioacetamide	Leather, Textiles, Paper	Solvent
			Stabilizer for fuel with tetraethyllead
			Substitute for Hydrogen sulfide in labs
			Solubilizer for riboflavin
		Medicine	Analytical reagent
		Rubber	Accelerator for buna rubber
U219	Thiourea		Removal of mercury from wastewaters
		Cosmetics	In hair preparations
			Preparation of non-glare mirrors
		Paper Manufacturing	In paper whiteners
		Wood Preserving	Stain prevention of hemlock wood
			In scrub soln for waste gas containing NO(X)&SO(X)
		Paper	Stabilizer for diazo coating solns for copy film & paper
			Reagent for bismuth, selenite ions
		Adhesives and Sealants	Liquifier/peptizing agent for glue
			In dry-cleaning chemicals
			Chelating agent
			Synthesis of sulfthiazole

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U219	(continued)		Catalyst in isomerization of maleic to fumaric acid
			Intermediate for 5-Iodo-2-thiouracil
			In cleaning and plating baths for metals
		Textiles	Manufacture of fire retardant for lacy fabrics
			Metal corrosion inhibitor for pickling solutions
			Radioprotector in X-irradiated mice
			Reduces interferences for analysis of cadmium
			Vulcanization accelerator
			In mineral oil
		Agricultural Chemicals	Fungicide Sprout accelerator in dormant tubers
		Dyes and Pigments	Dye intermediate
		Photography	Photographic fixing agent and remove stains from negatives Complexing agent for color print photography
		Pesticides	Synthesis of insecticides
		Pharmaceuticals	Synthesis of pharmaceuticals
		Plastics and Resins	Manufacture of resins
		Textiles	In-boiler water treatment Flame-proofing agent for nylon Weighting agent for silk
		Veterinary Medicine	Experimentally as thyroid inhibitor or goitrogen Medication
U220	Toluene	Organic Chemicals Manufacturing	Manufacture of benzoic acid, benzaldehyde
		Explosives	Manufacture of explosives
		Dyes and Pigments	Manufacture of dyes
			Manufacture of caprolactam
		Food	Manufacture of saccharin
		Medicine	Manufacture of medicines
		Cosmetics and Fragrance	Manufacture of perfumes

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (s)
U220	(continued)	Toy Manufacturing	Adhesive solvent in plastic toys and model airplanes
		Plastics and Resins	Solvent for paints, lacquers, gums, resins
			Extraction of various principals from plants
		Petroleum Refining	Gasoline additive
		Dyes and Pigments	Chemical intermediate for dyes
U222	o-Toluidine hydrochloride		Ingredient in fire-resistant chemicals
U225	Bromoform	Organic Chemicals Manufacturing	Chemical intermediate for organic synthesis
			Solvent in liquid-solvent extractions
			Flotation agent in sedimentary petrographical surveys
			Catalyst/sensitizer in polymer reactions
			Solvent for waxes,greases,& oils
			Flotation agent in purification of materials (quartz)
			Flotation agent in mineral separation
			In gauge fluid
			Reagent for graphite ore fractionation
			Solvent in nuclear magnetic resonance studies
		Aircraft/Aerospace	No information available
		Pharmaceuticals	Sedative Synthesis of pharmaceuticals
		Rubber	Catalyst/sensitizer in vulcanization of rubber
		Shipbuilding	No information available
U226	1,1,1-Trichloroethane		Cold-type metal cleaning
			Cleaning plastic molds
			Solvent for fats, waxes, natural resins, alkaloids
U227	1,1,2-Trichloroethane		Solvent for fats, waxes, resins, oils, rubber, paints, varnishes, cellulose esters and ethers
U228	Trichloroethylene		Solvent extraction

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U228	(continued)		Degreasing
		Dry Cleaning	
		Organic Chemicals Manufacturing	
		Pharmaceutical	
U234	sym-Trinitrobenzene		Acid-base indicator for 12.0-14.0 pH
		Explosives	Explosive
		Rubber	Vulcanize natural rubber
U236	Trypan blue		Biological stain
		Dyes and Pigments	Dye for textiles,leather,paper
		Medicine	Therapeutic agent for sleeping sickness
U237	Uracil Mustard	Medicine	Antineoplastic agent (essentially obsolete drug)
U238	Ethyl carbamate		Formerly as adjunct to sulfonamide therapy
			Preparation and modification of amino resins
		Medicine	Anti-neoplastic agent
			Solvent for barious organic materials
		Agricultural Chemicals	Solubilizer and co-solvent for fumigants
		Biochemical Research	No information available
		Cosmetics	Solubilizer and co-solvent
		Pesticides	Solubilizer and co-solvent
		Pharmaceuticals	Formerly topical bactericide Formerly component sclerosing soln for varicose veins Intermediate for pharmaceuticals
		Textiles	Chemical intermediate for N-hydroxymethyl derivatives
		Veterinary Medicine	Anesthetic, hypnotic, sedative, diuretic
U239	Xylenes		As a solvent
		Organic Chemicals Manufacturing	Raw material in production of benzoic acid, phthalic anhydride, isophthalic and terephthalic acids
		Textile and Fiber	Manufacture of polyester fibers

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
U239	(continued)	Dyes and Pigments	Manufacturing dyes
			Sterilizing catgut
		Laboratories	With Canada balsam as oil-immersion in microscopy Cleaning agent in microscope techniques
U240	2,4-D, Salts and esters	Pesticide	Systemic herbicide
U243	Hexachloropropene		Solvent
		Plastic and Resin	Plasticizer
			Hydraulic fluid
			Preparation of uranium tetrachloride
			Production of monochloropentene
U244	Thiram		Peptizer for polysulfide elastomer
		Agricultural Chemicals	Fungicide for industrial textiles
		Wood Preserving	Preservative
			Activator for guanidine,amine,& thiazole cure systems
		Food Products	Mushroom disinfectant
			Antioxidant in polyolefins
		Rubber	Vulcanizing agent for rubber Accelerator for natural & isoprene rubbers,etc.
		Paper	Fungicide for use on paper, polyurethane foam products
		Pharmaceuticals	Bacteriostat in soap and antiseptic sprays
			Activator for sulfenamide accelerators
		Agricultural Chemicals	Fungicide for seed treatment Animal repellent for trees and shrubs
U247	Methoxychlor	Pesticide	Insecticide
U248	Warfarin	Agricultural Chemical Manufacturing	Rodenticide for norway rats and house mice
		Medicine	Anticoagulant therapy
P001	Warfarin	Agricultural Chemical Manufacturing	Rodenticide for norway rats and house mice

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
P001	(continued)	Medicine	Anticoagulant therapy
P002	1-Acetyl-2-thiourea		No information available
P003	Acrolein	Agricultural Chemical Manufacturing	Pesticide
		Organic Chemical Manufacturing	Chemical intermediate in synthesis of glycerin, acrylic acid and esters
		Pharmaceutical Manufacturing	Chemical intermediate for pharmaceuticals
		Plastics and Resins Manufacturing	Chemical intermediate for glycerol, polyurethane, and polyester resins
		Agricultural Chemical Manufacturing	Aquatic herbicide, biocide, slimicide
		Military	Component of military poison gases
P004	Aldrin		Lacrimogenic warning agent in methyl chloride refrigerant
P005	Allyl alcohol	Pesticide	Insecticide, fumigant
		Agricultural Chemical Manufacturing	Herbicide for weed, seeds and fungi
		Organic Chemical Manufacturing	Intermediate in synthesis of glycerin
P007	5-Aminoethyl-3-isoxazolol	Plastics and Resins Manufacturing	Manufacture of resins and plasticizers Laboratory use
		Medicine	Antiemetic
P008	4-Aminopyridine	Plastics	Solvents, reagents and chemicals
P014	Thiophenol (Benzenethiol)	Agricultural Chemicals,	Chemical intermediate for carbophenothion fungicide
		Pesticides	Chemical intermediate for carbophenothion insecticide & acaricide
P016	Bis-(chloromethyl)ether	Plastics	Alkylating agent in manufacture of polymers
		Specialty Chemical	Monitoring indicator for chloromethyl ether Intermediate in synthesis of anionic exchange strong-base resins Lab reagent
P017	Bromoacetone	Plastics	Organic synthesis
		Munitions	Chemical war gas Tear gas
P018	Brucine	Specialty Chemical	Reagent for separating racemic mixtures

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
P018	(continued)		Denaturant for ethanol
P020	Dinoseb	Pesticide	Herbicide
P022	Carbon disulfide	Clothing	Chemical intermediate for rayon
		Automobile Manufacturing	Corrosion inhibitor
		Metals Recovery	Agent in removal of metals form waste water
		Wood, Housing	Putty preservatives
		Lubricants, Wax, Soap, Food	Tallow
		Chemical	Catalyst and catalyst adjuvant and activator
		Specialty Chemical	Dissolving free sulfur,phosphorous,iodine Regenerator for transition metal sulfide catalysts Manufacture of xanthogenates Xanthation of cellulose in preparation of viscose Flame lubricant in cutting glass Chemical intermediate for carbon tetrachloride
		Plastics	Chemical intermediate for cellophane
			Solvent for phosphorous,selenium,bromine,iodine,fats & resins
		Medicine	Optical glass
		Electroplating	Agent in metal treatment and plating (gold and nickel)
		Plastics	Polymerization inhibitor for vinyl chloride
		Electronic	Electronic vacuum tubes
			Solvent for cleaning and extractions
		Petroleum	Generating petroleum catalysts
			Solvent for waxes,lacquers,camphor,resins,vulcanized rubber
			Chemical intermediate for sulfur and carbonyl sulfide,xanthates
		Rubber	Rubber cement
		Adhesives and Sealants	Chemical intermediate for adhesives for food packaging
		Agricultural Chemicals	Solvent in extraction of growth inhibitors Preservation of fresh fruit
		Explosive	Explosives

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
P022	(continued)	Film	Development restrainer for instant color photography
		Pesticides	Solvent for pesticide intermediates Fumigant
		Agricultural Chemical	Seed treatment on conifers Soil disinfectants
		Petroleum Refining	Rocket fuel
		Plastics and Resins	Paints,enamels,varnishes,paint removers
		Rubber	Chemical intermediate for rubber compounds Cold vulcanization of rubber
		Veterinary Medicine	Veterinary anthelmintic
P023	Chloroacetaldehyde	Timber	Bark removal from trees
		Specialty Chemical	Chemical intermediate In manufacture of 2-aminothiazole
		Water Treatment	Control of algae,bacteria,and fungi in water
		Agricultural Chemicals	Fungicide
		Dentistry	As spinning solution of poly B-aniline
P024	p-Chloroaniline	Agricultural Chemicals	Chemical intermediate for urea herbicides
		Dyes and Pigments Manufacturing	Chemical intermediate for dyes and pigments
P026	1-(o-Chlorophenyl)thiourea		Not manufactured or used industrially in U.S.
P027	3-Chloroproprionitrile	Specialty Chemical	Combines reactivity of nitrile and an alkyl halide
		Pharmaceuticals Manufacturing	Pharmaceutical and polymer synthesis
P028	Benzyl chloride	Specialty Chemical	Chemical intermediate for other benzyl phthalates Chemical intermediate for n-butyl benzyl phthalate Manufacture of benzyl compounds Synthesis of tribenzyltin chloride Blocking agent to monoalkylated piperazine Conversion of tertiary amines to quaternary ammonia chlorides
		Agricultural Chemicals	Manufacture of batericides
		Flavoring	Manufacture of flavors and odorants
		Cosmetics and Fragrances	Manufacture of perfumes
		Pharmaceuticals	Manufacture of pharmaceutical products

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
P028	(continued)	Dyes and Pigments	Manufacture of synthetic tannins Pickling inhibitors
		Photography	Manufacture of photographic developer
		Dyes and Pigments	Manufacture of dyes
		Lubricant Manufacturing	Manufacture of lubricants
		Plastics and Resins	Manufacture of artificial resins Manufacture of plastics and plasticizers
			Production of electron-beam-sensitive fluid media
		Agricultural Chemicals	Manufacture of fungicides
		Pesticides	Manufacture of insecticides
		Petroleum Refining	Gasoline gum inhibitor
		Pharmaceuticals	Penicillin precursors
		Rubber	Rubber accelerators
P034	2-Cyclohexyl-4,6-dinitrophenol	Pesticide	Insecticide
P037	Dieldrin	Pesticide	Insecticide
P042	Ephinephrine	Medicine	To counter allergic reactions, prolong infiltration anesthetics Adrenergic agent Sympathomimetic, vasconstrictor, cardiac stimulant, bronchodilator
P045	Thiofanox	Pesticides	Systemic soil insecticide Acaricide and nematocide (soil & seed treatment)
P046	alpha,alpha-Dimethyl phenethylamine	Medicine	No information available
P047	4,6-Dinotro-o-cresol and salts	Pesticide	Ovicidal spray for fruit trees
P048	2,4-Dinitrophenol	Pesticide	Insecticide
P049	2,4-Dithiobiuret	Pesticides	Manufacture of insecticides, rodenticides
		Plastics and Resins	Plasticizer, intermediate in resin manufacture
		Rubber	Rubber accelerator
P050	Endosulfan	Pesticide	Insecticide for vegetables
P051	Endrin and metabolites	Pesticide	Insecticide, in dieldrin
P054	Aziridine	Specialty Chemical	In binders

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
P054	(continued)	Plastics	Comonomer for polymers
		Specialty Chemical	Monomer for polyethyleneimine As flocculation aids In surfactants In ion exchange resins Chemical intermediate for N-(2-hydroxyethyl)ethyleneimine Manufacture of trimethylmelanine Manufacture of taurine
		Paint Manufacturing	In lacquers
		Cosmetics	In cosmetics
		Adhesives and Sealants	In adhesives
		Agricultural Chemicals	As plant mutagen to improve varieties Exhibits sporicidal action
		Photography	In photographic chemicals
		Paper	Polymerization products
		Pesticides	Control of insect pests by chemosterilization
		Petroleum Refining	In petroleum refining chemicals, fuels, oils
		Textiles	Strengthening, shrinkproofing, stiffening, flameproofing, waterproofing
P057	2-Fluoroacetamide	Pesticides	Insecticide Rodenticide
P058	Fluoroacetic acid	Pesticides	Rodenticide Predacide (predatory animals)
P059	Heptachlor	Pesticide	Insecticide for cotton boll weevil
P060	Isodrin	Pesticide	Manufacture and use discontinued in U.S.
P064	Isocyanic acid, methyl ether	Agricultural Chemicals	Chemical intermediate for carbamate herbicides
		Pesticides	Chemical intermediate for carbamate insecticides
P066	Methomyl	Pesticides	Nematocide, insecticide
P067	2-Methylaziridine	Food	Chemical intermediate in gelatins
		Specialty Chemical	Comonomer for polymer with methacrylic acid & esters Chemical intermediate for Tris(2-methyl-1,3,5-triazine Fiber modification

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
P067	(continued)	Adhesives and Sealants	As polymer
		Agricultural Chemicals	In imine derivatives for agricultural chemicals
		Dyes and Pigments	As polymer
		Film	Chemical intermediate in photography
		Oil Additives	Modifiers for viscoscity, high pressure performance, oxidation resist. Chemical intermediate for oil additives
		Paper	As polymer
		Petroleum Refining	Flocculants, modifier for rocket propellent fuels
		Pharmaceuticals	Organic intermediate In imine derivatives for medicinal chemicals
		Plastics and Resins	Chemical intermediate in modification of latex coating resins
		Rubber	Organic intermediate
		Textiles	As polymer
P069	Methyllactonitrile	Specialty Chemical	Chemical intermediate for methyl methacrylate Reagent in formation of aldehyde cyanohydrins Chemical intermediate for methacrylic acid & higher esters
		Pharmaceuticals	Used to produce a pharmaceutical intermediate Stereoselective hydrocyanating reagent
		Petroleum	Complexing agent for metals refining and separation
		Pesticides Manufacturing	Manufacture insecticides
P070	Aldicarb	Pesticides	Insecticide, acaracide, nematocide
P072	1-Naphthyl-2-thiourea	Pesticides	Rodenticide for Norway rat (former use)
P075	Nicotine	Leather and Tanning	In tanning
		Agricultural Chemicals	Greenhouse fumigant
		Pesticides	Insecticide
		Veterinary Medicine	Ectoparasitic, anthelmintic
P077	4-Nitroaniline	Automobile Manufacturing	Corrosion inhibitor
		Petroleum	Chemical intermediate for gasoline gum inhibitors
		Dyes and Pigments	Chemical intermediate for dyes and pigments

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
P077	(continued)	Specialty Chemical	Chemical intermediate for antioxidants. Chemical intermediate for P-Phenylenediamine
		Pharmaceuticals	No information available
		Veterinary Medicine	For poultry
P082	N-Nitrosodimethylamine	Lubricant Manufacturing	In lubricants
		Research	Research chemical
		Specialty Chemical	Preparation of thiocarbonyl fluoride polymers Chemical intermediate for 1,1-Dimethylhydrazine (former use) Antioxidant
		Petroleum refining	Production of rocket fuels (former use)
			Condensers to increase dielectric constant
			Inactive metal anode-electrolyte systems (high-energy batteries)
		Plastics	Plasticizer for acrylonitrile polymers, solvent Softener for copolymers
		Fibers	Solvent
			Industrial solvent
		Agricultural Chemicals	Inhibition of nitrification in soil
		Pesticides	As nematocide
		Rubber	Plasticization of rubber Rubber accelerator
P084	N-Nitrosomethylvinylamine		Research chemical
P088	Endothall	Agricultural Chemical Manufacturing	Herbicide, defoliant, dessicant, growth regulator, aquatic algicide and herbicide
P093	N-Phenylthiourea	Medicine	In genetics research
		Agricultural Chemicals	Rabbit,rat,weasel repellent
P095	Phosgene	Plastics and Resins	Monomer for polycarbonate resins
		Specialty Chemical	Chemical intermediate for toluene diisocyanate Chemical intermediate for methyl isocyanate Chemical intermediate for polymethylene polyphenylisocyanate Intermediate, carbonylating agent Chemical intermediate for diethyl carbonate,dimethyl carbamoyl chloride

TABLE A-1 (Continued)

INDUSTRIAL USE OF U AND P CHEMICAL PRODUCTS

WASTECODE	NAME	INDUSTRY	USE (a)
P095	(continued)		Chemical intermediate for diphenylmethane-4,4'-diisocyanate Chemical intermediate for acyl chlorides, chloroformate esters
		Munitions	War gas
		Dyes and Pigments	Production of aniline dyes
		Organic Chemicals Manufacturing	Preparation of organic chemicals
P101	Propanenitrile		Solvent, dielectric fluid, intermediate
			Experimental applications: ulcerogen
		Specialty Chemical	Chemical intermediate for Di-n-propylamine
P102	Propargyl alcohol	Automotive	Corrosion inhibitor
			Prevent hydrogen embrittlement of steel
		Organic Chemical Manufacturing	Solvent stabilizer
		Agricultural Chemical Manufacturing	Soil fumigant
		Commercial Testing Laboratories	Lab reagent
		Pharmaceutical Manufacturing	Manufacture of pharmaceuticals
P108	Strychnine	Pesticides	Destroying predatory animals and trapping fur-bearing animals Rodent control in forage crops production Rodent control in fruit production
P116	Thiosemicarbazide		Reagent for ketones and certain metals
		Agricultural Chemicals	Chemical intermediate for herbicides Fungicide for rice
		Pesticides	Rodenticide
		Photography	No information available
P118	Trichloromethanethiol		No information available
P123	Toxaphene	Pesticide	Pesticide for cotton crops

(a) Sources: National Library of Medicine, Toxicology Data Network, Hazardous Substances DataBank (HSDB) (Reference 33).
Handbook of Environmental Data on Organic Chemicals (Reference 38).
Merck Index 1983. (Reference 39).

Table A-2

NUMBER OF FACILITIES THAT MAY GENERATE U AND P WASTES INCLUDED IN BACKGROUND DOCUMENT VOLUMES A, B, AND C

Waste Code	Number of Facilities*	Waste Code	Number of Facilities*	Waste Code	Number of Facilities*	Waste Code	Number of Facilities*
P001	3	U019	71	U113	5	U207	1
P002	1	U020	9	U114	1	U208	1
P003	2	U021	5	U116	1	U209	3
P004	3	U022	6	U117	5	U210	32
P005	3	U024	1	U118	2	U211	33
P008	5	U025	2	U120	1	U213	6
P014	6	U026	1	U121	12	U220	48
P016	4	U027	1	U122	73	U221	9
P017	4	U029	3	U123	1	U222	1
P018	3	U030	1	U124	6	U223	38
P020	1	U031	11	U125	5	U225	6
P022	14	U033	8	U126	0	U226	44
P023	5	U034	6	U127	3	U227	5
P024	6	U036	10	U128	2	U228	39
P026	1	U037	10	U129	20	U234	1
P027	2	U038	2	U130	6	U236	2
P028	20	U039	1	U131	4	U238	4
P034	1	U041	2	U132	2	U239	42
P037	9	U042	1	U137	1	U240	18
P042	5	U043	14	U138	19	U243	1
P045	1	U044	38	U140	8	U244	2
P046	1	U045	13	U141	2	U247	8
P047	2	U046	3	U142	6	U248	3
P048	2	U047	2	U147	8		
P050	6	U048	2	U148	10		
P051	3	U050	1	U149	1		
P054	2	U051	13	U152	4		
P057	2	U052	5	U153	1		
P058	1	U053	4	U154	12		
P059	5	U055	11	U155	3		
P064	4	U056	10	U156	2		
P066	6	U057	18	U157	1		
P067	3	U060	1	U158	8		
P069	2	U061	26	U159	31		
P070	5	U063	1	U161	5		
P072	1	U064	1	U162	3		
P075	3	U066	5	U163	6		
P077	9	U067	9	U164	4		
P082	1	U068	9	U165	17		
P084	1	U070	8	U166	4		
P088	3	U071	6	U167	17		
P093	1	U072	13	U168	2		
P095	23	U073	4	U169	17		
P101	7	U074	1	U170	2		
P102	3	U075	19	U171	4		
P108	6	U076	1	U174	3		
P116	8	U077	23	U177	1		
P118	2	U078	2	U181	1		
P123	4	U079	3	U182	0		
U001	6	U080	41	U183	2		
U002	13	U081	3	U184	2		
U003	22	U082	4	U185	6		
U004	7	U083	2	U186	3		
U005	1	U084	2	U187	5		
U006	13	U085	0	U188	13		
U007	19	U089	3	U191	11		
U008	4	U091	2	U192	1		
U009	22	U092	11	U194	8		
U010	4	U094	4	U196	6		
U011	6	U095	2	U197	1		
U012	27	U105	11	U200	7		
U014	4	U106	4	U201	1		
U016	NA	U108	9	U202	3		
U017	2	U110	7	U203	6		
U018	2	U112	5	U206	3		

* Sources: National Library of Medicine, Toxicology Data Network,
Hazardous Substances Databank (HSDB) (Reference 33)
1987, 1988 SRI Directory of Chemical Producers, USA (References 34 and 35)
U.S. EPA 1986 TSDR Survey (Reference 36)

Table A-3
NUMBER OF FACILITIES IN EACH STATE THAT MAY GENERATE U AND P WASTES
INCLUDED IN BACKGROUND DOCUMENT VOLUMES A, B, AND C

State	EPA Region	Waste Codes (Number of Facilities)
Alabama	IV	P014(1) P022(1) P034(1) P042(1) P095(1) P101(1) U019(2) U020(1) U038(1) U061(1) U080(1) U122(3) U129(2) U051(1) U170(1) U210(1) U211(2) U220(1) U228(1) U239(2) U244(1)
Alaska	X	U061(1) U220(1) U226(1) U227(1) U228(1) U240(2)
Arizona	IX	U211(1) U219(1) U220(2) U223(1) U228(1)
Arkansas	VI	P047(1) U029(2) U061(1) U067(3) U122(2) U211(1) U220(1) U226(1) U240(1)
California	IX	P004(1) P037(1) P042(1) P064(1) P108(1) U002(1) U033(1) U057(2) U061(2) U067(1) U070(1) U072(1) U075(3) U080(3) U082(1) U121(3) U122(1) U124(1) U129(1) U138(1) U051(1) U159(2) U161(1) U188(1) U211(1) U218(1) U220(2) U223(1) U225(1) U226(6) U228(4) U239(4)
Colorado	VIII	P066(1) U226(1) U239(1)
Connecticut	I	P022(1) P116(1) U006(1) U007(1) U031(1) U044(2) U073(1) U075(1) U077(1) U080(1) U091(1) U092(1) U138(1) U148(1) U158(1) U159(1) U163(1) U210(1) U219(1) U220(1) U223(3) U226(2) U239(1) U244(3)
Delaware	III	P014(1) P022(1) P028(1) P050(1) P066(1) P070(1) P077(1) P095(1) P101(1) P108(1) U006(2) U007(1) U009(1) U011(1) U012(1) U018(1) U019(1) U020(1) U022(1) U036(1) U044(1) U048(1) U055(1) U056(1) U061(1) U070(2) U071(1) U072(2) U074(1) U077(1) U079(1) U080(1) U089(2) U092(1) U105(1) U114(1) U116(1) U127(1) U131(1) U138(1) U148(1) U152(1) U154(1) U163(1) U165(1) U167(1) U169(1) U185(1) U194(1) U202(1) U209(1) U210(2) U211(1) U218(1) U220(1) U223(1) U226(1) U227(1) U228(1) U239(1) U240(1) U247(1)
Florida	IV	P016(1) P088(1) U057(1) U075(1) U080(1) U082(1) U092(1) U110(1) U125(1) U142(2) U147(1) U154(1) U158(1) U194(1) U210(1) U220(2) U223(2) U226(2) U228(1) U239(2)
Georgia	IV	P050(1) P070(1) U033(1) U057(1) U061(2) U114(10)U122(1) U129(1) U051(1) U159(1) U170(1) U220(1) U228(2)
Hawaii	IX	P059(1) U061(1) U129(1) U240(1)
Idaho	X	U051(1) U228(1)
Illinois	V	P037(1) P042(1) P077(2) U003(3) U004(1) U009(3) U011(1) U012(1) U019(2) U033(1) U036(1) U037(1) U044(2) U045(1) U052(1) U057(1) U070(1) U072(1) U075(1) U077(1) U117(1) U121(2) U122(2) U130(1) U148(1) U051(2) U155(1) U158(1) U159(2) U165(1) U169(1) U171(1) U174(1) U191(1) U206(1) U210(1) U211(2) U219(1) U220(3) U223(1) U225(1) U226(2) U228(2) U234(1) U239(1) U240(4)
Indiana	V	P008(1) P017(1) P095(1) U002(1) U031(1) U080(1) U092(2) U171(1) U188(1) U191(1) U196(1) U228(1)
Iowa	VII	U061(1)
Kansas	VII	U002(1) U004(1) U057(1) U122(2) U132(1) U138(1) U159(1) U188(1)
Kentucky	IV	U009(1) U043(1) U044(1) U045(1) U057(1) U070(1) U075(1) U080(1) U092(1) U122(2) U051(1) U211(1) U220(1) U221(1) U226(1)
Louisiana	VI	P003(1) P022(1) P024(2) P095(3) U007(2) U008(1) U009(2) U012(2) U015(2) U016(1) U031(2) U036(1) U037(1) U039(1) U043(6) U044(1) U045(2) U057(1) U061(1) U077(6) U080(1) U108(1) U113(1) U121(1) U122(5) U148(5) U154(3) U159(1) U162(1) U165(1) U169(1) U185(1) U188(1) U194(1) U200(1) U211(2) U213(1) U220(3) U221(2) U223(3) U227(1) U239(2) U247(1)
Maine	I	U036(1)
Maryland	III	P095(1) U042(1) U080(1) U156(1) U223(2) U226(1) U228(3)
Massachusetts	I	P023(2) P050(1) U003(2) U007(1) U009(1) U044(2) U053(1) U057(1) U080(2) U108(1) U110(1) U112(1) U122(1) U051(1) U159(2) U193(1) U194(1) U210(1) U220(2) U226(1) U238(1) U239(1) U247(1)

Table A-3 (continued)

NUMBER OF FACILITIES IN EACH STATE THAT MAY GENERATE U AND P WASTES
INCLUDED IN BACKGROUND DOCUMENT VOLUMES A, B, AND C

State	EPA Region	Waste Codes (Number of Facilities)
Michigan	V	P064(1) P088(1) P095(1) U007(1) U045(1) U068(1) U073(1) U075(1) U078(1) U080(1) U081(1) U110(1) U112(1) U121(1) U165(1) U206(1) U211(1) U219(1) U225(1) U240(1)
Minnesota	V	P067(1) P077(1) U019(1) U044(1) U061(1) U071(1) U080(2) U082(1) U122(1) U185(1) U226(1) U227(1) U247(1)
Mississippi	IV	P020(1) P022(1) P050(1) U012(2) U044(1) U114(1) U122(3) U129(2) U169(1) U211(1) U220(1) U223(1) U226(1) U228(1) U247(1)
Missouri	VII	P004(1) P037(1) P050(1) P051(1) P059(1) P066(1) P070(1) P101(1) P108(1) P123(1) U003(1) U006(1) U007(2) U011(1) U012(1) U019(2) U036(1) U037(1) U044(1) U056(1) U061(2) U072(1) U075(1) U077(1) U079(1) U080(2) U091(1) U117(1) U122(1) U129(1) U131(1) U155(1) U158(1) U165(1) U167(1) U169(1) U183(1) U185(1) U187(1) U200(1) U211(1) U220(3) U225(1) U239(1) U240(1) U247(1)
Montana	VIII	U122(1)
Nebraska	VII	U125(1)
Nevada	IX	P123(1) U034(1) U061(1) U072(1) U080(1) U228(1) P014(1)
New Jersey	II	P001(1) P017(2) P018(1) P022(1) P023(1) P024(2) P028(6) P037(1) P047(1) P048(1) P057(1) P067(2) P072(1) P077(1) P095(1) P116(3) U002(1) U004(3) U006(5) U007(3) U009(1) U011(1) U012(3) U014(3) U017(1) U019(1) U031(2) U033(1) U037(1) U044(3) U045(1) U052(1) U057(1) U061(2) U067(1) U068(4) U071(1) U072(1) U075(4) U080(2) U092(1) U105(1) U108(3) U110(1) U117(1) U121(2) U122(5) U124(1) U125(1) U138(6) U141(1) U147(1) U148(2) U159(10)U161(1) U163(1) U165(2) U166(1) U167(1) U169(2) U181(1) U187(1) U188(1) U191(2) U194(1) U196(2) U200(2) U203(4) U218(4) U219(2) U220(1) U222(1) U223(1) U226(2) U228(2) U236(2) U238(1) U239(3) U244(1) U248(1)
New Mexico	VI	P095(1) U209(1) U210(1) U211(1) U220(1) U223(1) U225(1) U226(2) U228(1) U239(1)
New York	II	P001(1) P008(1) P016(1) P017(1) P022(1) P023(1) P027(1) P028(1) P075(1) P093(1) P095(1) P101(1) P108(2) P116(2) U003(3) U007(3) U009(1) U010(2) U012(1) U020(2) U021(2) U022(2) U037(1) U044(4) U045(2) U046(1) U047(1) U052(1) U057(1) U061(1) U064(1) U067(1) U068(2) U070(1) U077(1) U080(2) U094(1) U095(1) U105(1) U114(1) U122(3) U129(1) U130(1) U138(4) U140(1) U147(1) U159(3) U163(1) U165(2) U166(1) U169(3) U184(1) U187(2) U191(3) U196(2) U200(1) U202(1) U207(1) U210(5) U211(3) U219(3) U220(2) U221(1) U223(8) U228(3) U239(3) U248(1)
North Carolina	IV	P008(1) P014(1) P022(1) P028(1) P037(1) P048(1) P050(1) P051(1) P059(1) P101(1) P123(1) U003(2) U005(1) U006(1) U007(1) U009(1) U010(1) U011(1) U012(2) U014(1) U018(1) U019(1) U021(1) U022(1) U034(1) U036(2) U037(1) U043(1) U044(2) U050(1) U056(1) U064(1) U067(1) U068(1) U070(1) U077(1) U080(2) U089(1) U092(1) U110(1) U119(1) U122(6) U127(1) U128(1) U129(1) U141(1) U142(1) U148(1) U157(1) U158(1) U163(1) U165(1) U168(1) U169(1) U174(1) U177(1) U200(1) U203(1) U210(2) U211(1) U220(1) U221(1) U226(1) U228(1) U238(1) U239(1)
North Dakota	VIII	U061(1)
Ohio	V	P037(1) P077(1) P095(2) P118(1) U001(2) U003(1) U007(1) U009(2) U012(6) U019(1) U021(1) U033(1) U034(1) U037(1) U044(5) U056(3) U057(1) U061(1) U071(1) U072(1) U077(1) U080(3) U095(1) U108(1) U122(4) U125(1) U131(1) U138(1) U051(1) U185(1) U188(1) U194(1) U202(1) U210(2) U211(2) U220(2) U221(1) U223(3) U226(5) U228(4) U239(3) U240(2)
Oklahoma	VI	U210(1)
Oregon	X	U019(1) U037(1) U038(1) U077(1) U122(8) U220(1) U239(1)
Pennsylvania	III	P024(1) P028(3) P037(1) P077(1) U001(1) U002(2) U004(1) U006(1) U009(1) U011(1) U020(1) U024(1) U031(2) U044(2) U045(1) U046(1) U053(1) U055(2) U057(1) U061(2) U067(1) U072(1) U075(3) U077(2) U080(3) U105(1) U114(1) U117(1) U121(2) U122(2) U124(1) U129(2) U130(1) U142(1) U147(2) U152(1) U159(3) U165(1) U188(1) U191(1) U192(1) U196(1) U201(1) U210(1) U219(2) U220(2) U226(4) U228(2) U239(2) U240(1) U244(1)
Puerto Rico	II	U002(1) U003(2) U004(1) U019(1) U031(1) U037(1) U044(1) U056(1) U077(1) U080(1) U140(1) U169(1) U191(1) U220(1) U239(1)
Rhode Island	I	U138(1) U211(1)

Table A-3 (continued)

NUMBER OF FACILITIES IN EACH STATE THAT MAY GENERATE U AND P WASTES
INCLUDED IN BACKGROUND DOCUMENT VOLUMES A, B, AND C

State	EPA Region	Waste Codes (Number of Facilities)
South Carolina	IV	P008(1) P037(1) U017(1) U019(1) U044(1) U061(1) U072(1) U075(1) U077(1) U080(1) U108(1) U121(1) U122(4) U129(2) U130(1) U138(1) U142(1) U051(1) U210(2) U211(2) U219(1) U220(2) U226(2) U228(1) U239(2) U240(1)
Tennessee	IV	P022(1) P028(1) P059(1) P069(1) P075(1) U003(1) U012(1) U019(1) U020(1) U053(1) U061(1) U072(1) U112(1) U124(1) U129(1) U130(1) U140(1) U154(1) U159(1) U161(1) U162(1) U197(1) U211(1) U213(1) U228(1)
Texas	VI	P005(2) P014(1) P022(1) P066(2) P069(1) P095(5) P101(1) P116(1) P118(1) U001(3) U002(5) U003(4) U006(1) U007(1) U008(3) U009(4) U012(3) U019(4) U020(1) U025(1) U026(1) U027(1) U031(2) U033(1) U034(2) U036(1) U041(2) U043(5) U044(3) U045(1) U052(1) U056(1) U057(3) U061(2) U072(1) U073(1) U074(1) U077(3) U080(4) U081(1) U084(1) U092(1) U105(2) U106(1) U108(1) U112(2) U113(4) U114(1) U118(1) U122(10)U123(1) U129(2) U138(1) U140(4) U147(1) U051(1) U152(1) U153(3) U154(6) U156(1) U159(3) U161(1) U162(1) U165(4) U166(1) U169(1) U171(1) U188(3) U194(1) U210(3) U211(4) U213(1) U220(7) U221(2) U223(5) U226(2) U228(2) U239(1) U240(1)
Utah	VIII	P054(1)
Vermont	I	U044(1)
Virginia	III	P018(1) P077(1) U007(1) U019(2) U020(1) U036(1) U044(2) U057(1) U080(1) U110(1) U117(1) U129(1) U140(1) U051(1) U158(1) U167(1) U194(1) U210(3) U211(2) U219(1) U220(1) U223(2) U226(1) U228(1) U239(1)
Washington	X	P002(1) P016(1) P022(1) P028(1) P042(2) U019(1) U022(1) U043(1) U044(1) U055(1) U056(1) U064(1) U075(1) U080(1) U122(2) U152(1) U158(2) U169(1) U188(2) U210(1) U211(1) U219(1) U220(1) U226(2) U228(1) U239(2) U240(1)
West Virginia	III	P004(1) P022(1) P045(1) P064(2) P066(1) P070(2) U002(2) U003(1) U009(2) U012(2) U044(1) U045(2) U053(1) U070(1) U072(1) U077(1) U080(2) U092(1) U105(2) U106(2) U108(1) U116(2) U118(1) U122(2) U147(1) U148(1) U159(1) U161(1) U165(1) U169(2) U191(2) U210(1) U223(3) U244(1) U247(1)
Wisconsin	V	P001(1) P003(1) P005(1) P008(1) P014(3) P016(1) P017(1) P018(1) P022(1) P023(1) P024(1) P026(1) P027(1) P037(1) P046(1) P051(1) P054(1) P059(1) P075(1) P077(1) P082(1) P084(1) P095(1) P101(1) P102(1) P108(1) P116(1) P123(1) U003(1) U006(1) U007(1) U009(2) U010(1) U012(1) U019(1) U020(1) U021(1) U022(1) U029(1) U030(1) U034(1) U036(1) U037(1) U045(1) U046(1) U047(1) U048(1) U055(1) U056(1) U057(1) U060(1) U063(1) U064(1) U067(1) U068(1) U071(1) U072(1) U073(1) U074(1) U076(1) U077(1) U079(1) U081(1) U082(1) U083(1) U084(1) U089(1) U092(1) U105(1) U110(1) U116(1) U119(1) U120(1) U122(1) U125(1) U127(1) U128(1) U129(1) U130(1) U131(1) U132(1) U137(1) U138(1) U142(1) U147(1) U149(1) U051(1) U152(1) U153(1) U155(1) U163(1) U165(1) U166(1) U168(1) U169(1) U171(1) U174(1) U183(1) U185(1) U187(1) U193(1) U200(1) U203(1) U206(1) U208(1) U211(1) U214(2) U218(1) U219(1) U220(2) U221(1) U225(1) U226(1) U227(1) U238(1) U240(1) U243(1) U247(1) U248(1)

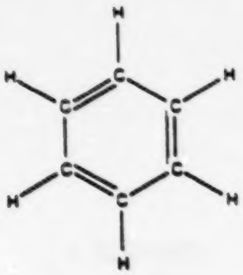
* Sources: National Library of Medicine, Toxicology Data Network,
Hazardous Substances Databank (HSDB) (Reference 33)
1987 and 1988 SRI Directory of Chemical Producers (References 34 and 35)
U.S. EPA 1986 TSDR Survey (Reference 36)

APPENDIX B

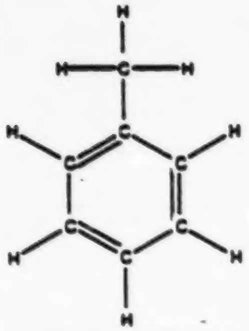
CHEMICAL STRUCTURE FOR U AND P WASTE CODES

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

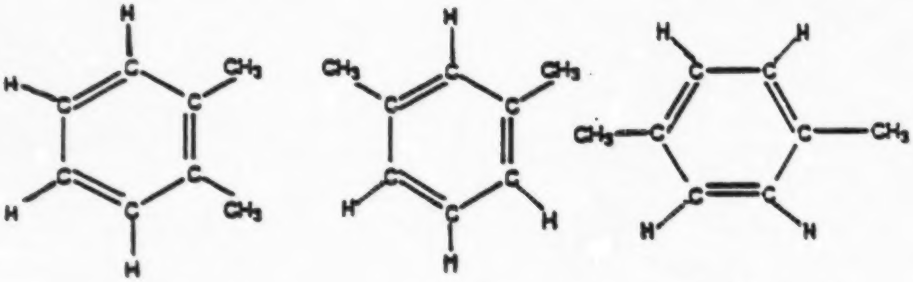
AROMATICS AND OTHER HYDROCARBON WASTES (ANALYZABLE)



U019: Benzene



U220: Toluene (methylbenzene)

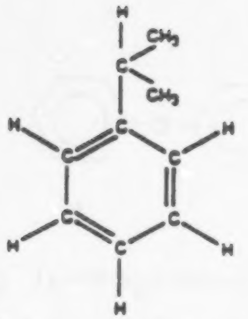


o-Xylene **m-Xylene** **para-Xylene**

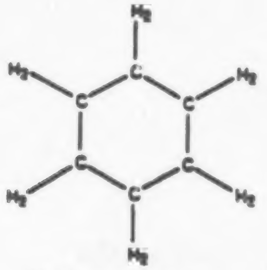
U239: Xylene(s)
ortho-Xylene, meta-Xylene and para-Xylene

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

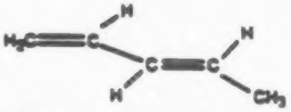
AROMATICS AND OTHER HYDROCARBON WASTES (NONANALYZABLE)


H
CH3
C
CH3
H
C
H
C
C
C
C
H
C
H
H

U055: Cumene (Isopropylbenzene)


H2
C
H2
H2
C
C
C
C
H2
C
H2
H2

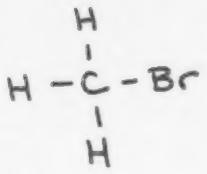
U056: Cyclohexane


H
H2C
C
H
C
C
H
CH3

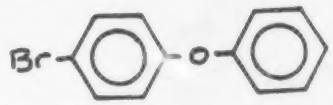
$CH_3CH=CHCH=CH_2$
U186: 1,3-PENTADIENE

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

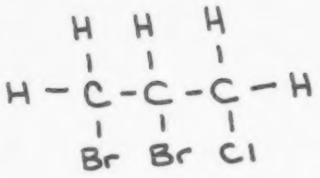
BROMINATED ORGANIC WASTES
(ANALYZABLE)



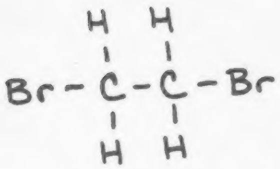
U029 methyl bromide



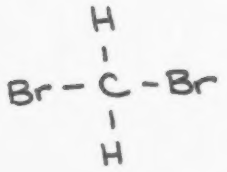
U030 4-Bromophenyl phenylether



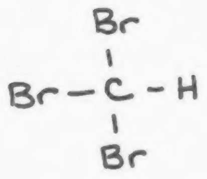
U066 1,2-Dibromo-3-chloropropane



U067 1,2-Dibromoethane
(Ethylene dibromide)



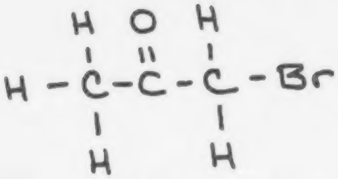
U068 Dibromomethane



U225 Bromoform

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

BROMINATED ORGANIC WASTES
(NONANALYZABLE)

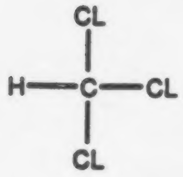


$$H-\underset{H}{\overset{H}{C}}-\overset{O}{\overset{\|}{C}}-\underset{H}{\overset{H}{C}}-Br$$

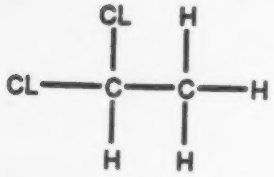
P017 Bromoacetone

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

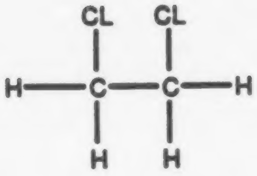
HALOGENATED ALIPHATIC WASTES
(ANALYZABLE)



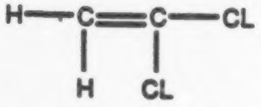
U044: Chloroform


CL H
CL—C—C—H
H H

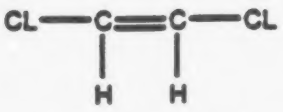
U076: 1,1-Dichloroethane


CL CL
H—C—C—H
H H

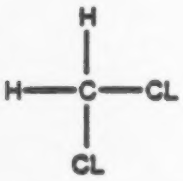
U077: 1,2-Dichloroethane



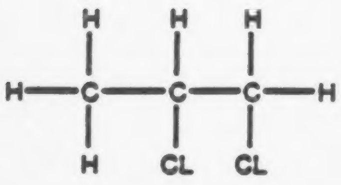
U078: 1,1-Dichloroethylene



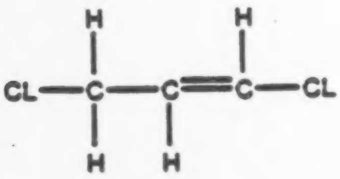
U079: 1,2-Dichloroethylene



U080: Methylene Chloride


H H H
H—C—C—C—H
H CL CL

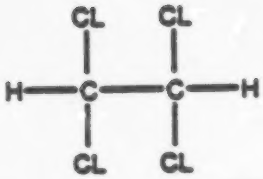
U083: 1,2-Dichloropropane


H H
CL—C—C=C—CL
H H

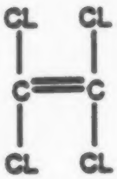
U084: 1,3-Dichloropropene

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

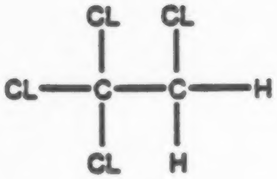
HALOGENATED ALIPHATIC WASTES (ANALYZABLE) (Continued)



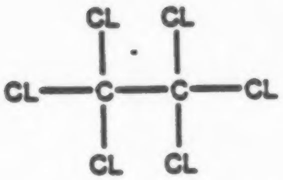
U209: 1,1,2,2-Tetrachloroethane



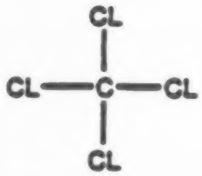
U210: Tetrachloroethylene



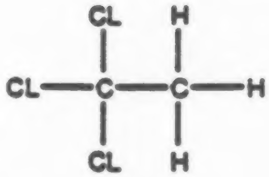
U208: 1,1,1,2-Tetrachloroethane



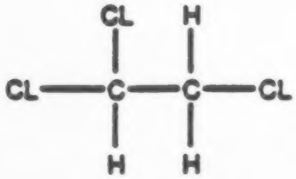
U131: Hexachloroethane



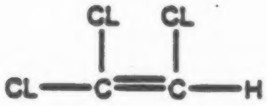
U211: Carbon Tetrachloride



U226: 1,1,1-Trichloroethane



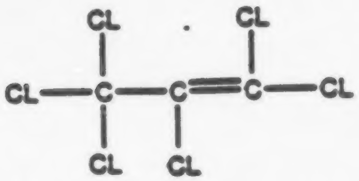
U227: 1,1,2-Trichloroethane



U228: Trichloroethylene

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

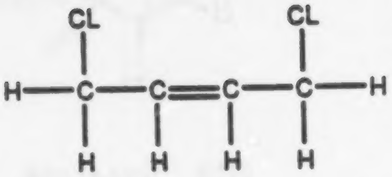
HALOGENATED ALIPHATIC WASTES
(ANALYZABLE) (Continued)


$\mathrm{Cl{-}CCl_2{-}CCl{=}CCl{-}Cl}$

U243: Hexachloropropene

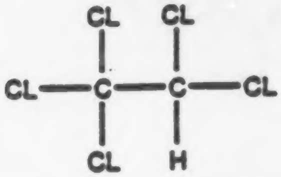
CHEMICAL STRUCTURES FOR U AND P WASTE CODES

HALOGENATED ALIPHATIC WASTES
(NONANALYZABLE)



$\mathrm{H-\overset{CL}{\underset{H}{C}}-\underset{H}{C}=\underset{H}{C}-\overset{CL}{\underset{H}{C}}-H}$

U074: 1,4-Dichloro-2-Butene

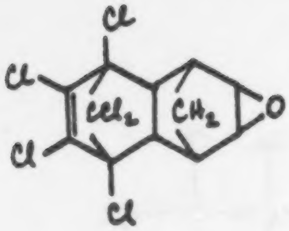


$\mathrm{CL-\overset{CL}{\underset{CL}{C}}-\overset{CL}{\underset{H}{C}}-CL}$

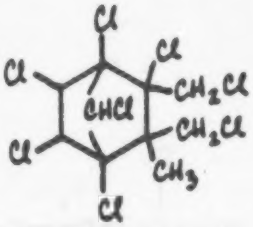
UI84: Pentachloroethane

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

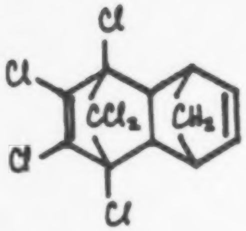
HALOGENATED PESTICIDES AND CHLOROBENZENES
(ANALYZABLE)


Cl
Cl
Cl
Cl
CCl2
CH2
O

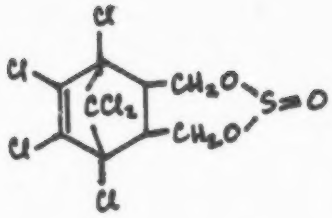
P037 Dieldrin
P051 Endrin } (stereoisomers)


Cl
Cl
Cl
Cl
Cl
CHCl
CH2Cl
CH2Cl
CH3

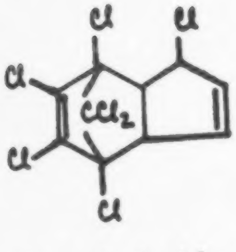
P123 Toxaphene


Cl
Cl
Cl
Cl
CCl2
CH2

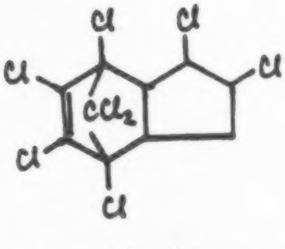
P004 Aldrin
P060 Isodrin } (stereoisomers)


Cl
Cl
Cl
Cl
CCl2
CH2O
CH2O
S=O

P050 Endosulfan


Cl
Cl
Cl
Cl
Cl
CCl2

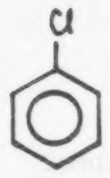
P059 Heptachlor


Cl
Cl
Cl
Cl
Cl
Cl
CCl2

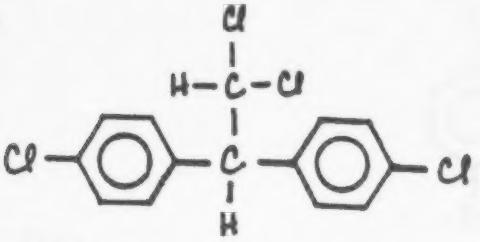
U036 Chlordane

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

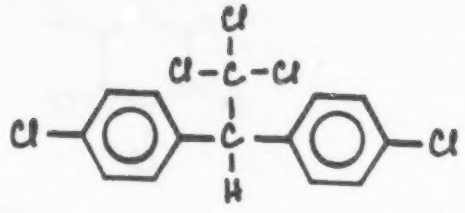
HALOGENATED PESTICIDES AND CHLOROBENZENES (ANALYZABLE) (Continued)



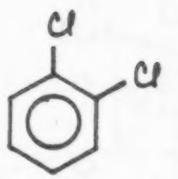
U037 Chlorobenzene


Cl
H—C—Cl
Cl
C
Cl
H

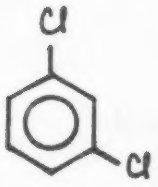
U060 Dichlorodiphenyldichloroethane; DDD


Cl
Cl—C—Cl
Cl
C
Cl
H

U061 Dichlorodiphenyltrichloroethane; DDT



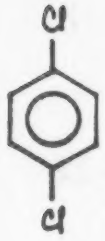
U070 1,2-Dichlorobenzene



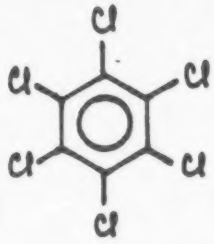
U071 1,3-Dichlorobenzene

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

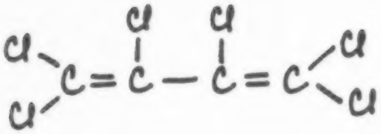
HALOGENATED PESTICIDES AND CHLOROBENZENES (ANALYZABLE) (Continued)



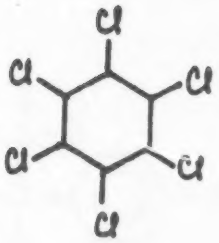
U072 1,4-Dichlorobenzene



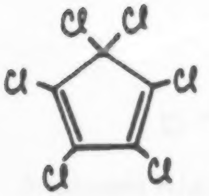
U127 Hexachlorobenzene



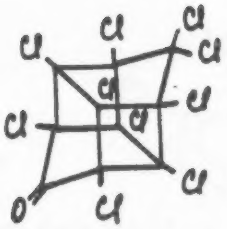
U128 Hexachlorobutadiene



U129 gamma-BHC
(Lindane)



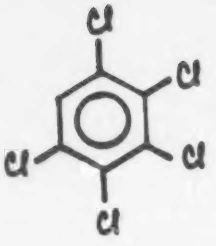
U130 Hexachlorocyclopentadiene



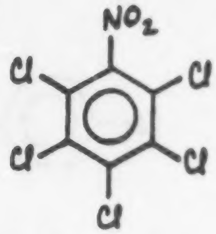
U142 Kepone

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

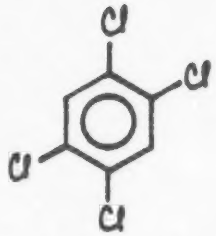
HALOGENATED PESTICIDES AND CHLOROBENZENES (ANALYZABLE) (Continued)



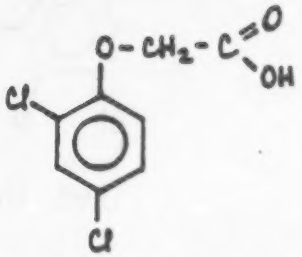
U183 Pentachlorobenzene



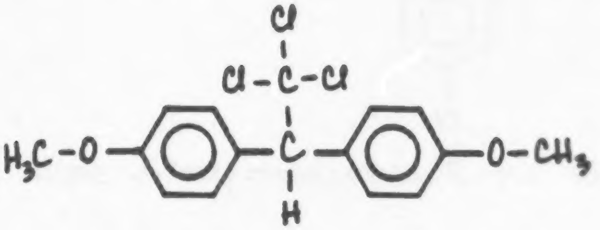
U185 Pentachloronitrobenzene



U207 1,2,4,5-Tetrachlorobenzene



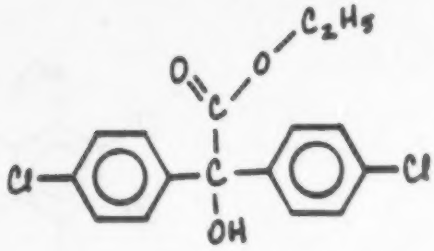
U240 2,4-Dichlorophenoxyacetic acid; 2,4-D



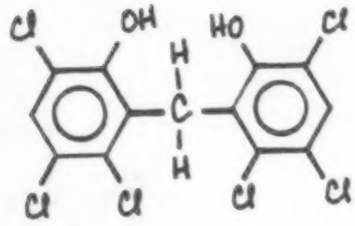
U247 Methoxychlor

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

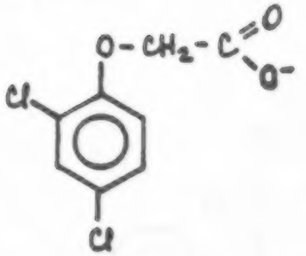
HALOGENATED PESTICIDES AND CHLOROBENZENES (NONANALYZABLE)



U038 Chlorobenzilate



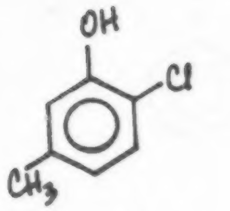
U132 Hexachlorophene



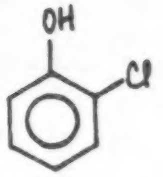
U240 2,4- Dichlorophenoxyacetic salts (and esters)

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

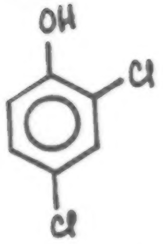
HALOGENATED PHENOLIC WASTES
(ANALYZABLE)



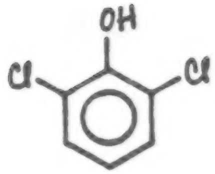
U039 p-Chloro-m-cresol



U048 2-Chlorophenol



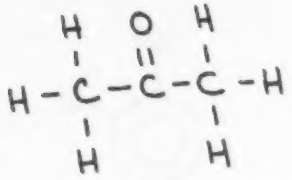
U081 2,4-Dichlorophenol



U082 2,6-Dichlorophenol

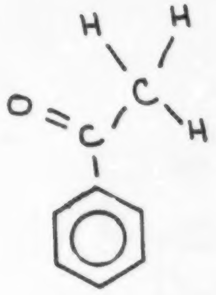
CHEMICAL STRUCTURES FOR U AND P WASTE CODES

OXYGENATED HYDROCARBON AND HETEROCYCLIC WASTES (ANALYZABLE)

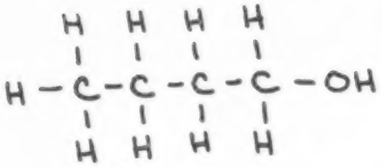


$\mathrm{H-\underset{H}{\overset{H}{C}}-\overset{O}{\overset{\|}{C}}-\underset{H}{\overset{H}{C}}-H}$

U002 Acetone

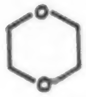


U004 Acetophenone

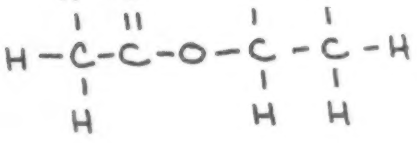


$\mathrm{H-\underset{H}{\overset{H}{C}}-\underset{H}{\overset{H}{C}}-\underset{H}{\overset{H}{C}}-\underset{H}{\overset{H}{C}}-OH}$

U031 n-Butyl alcohol

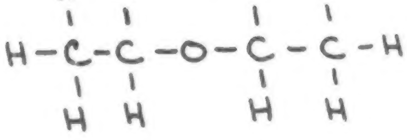


U108 1,4-Dioxane



$\mathrm{H-\underset{H}{\overset{H}{C}}-\overset{O}{\overset{\|}{C}}-O-\underset{H}{\overset{H}{C}}-\underset{H}{\overset{H}{C}}-H}$

U112 Ethyl acetate

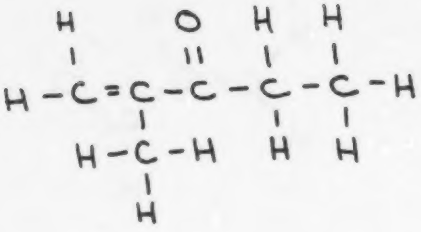


$\mathrm{H-\underset{H}{\overset{H}{C}}-\underset{H}{\overset{H}{C}}-O-\underset{H}{\overset{H}{C}}-\underset{H}{\overset{H}{C}}-H}$

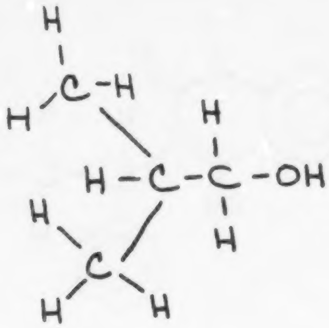
U117 Ethyl ether

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

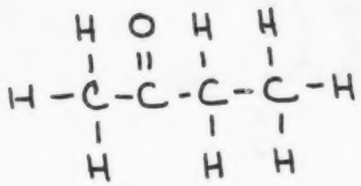
OXYGENATED HYDROCARBON AND HETEROCYCLIC WASTES (ANALYZABLE) (Continued)



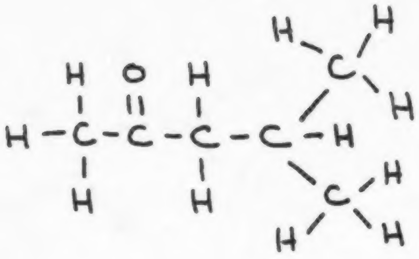
U118 Ethyl methacrylate



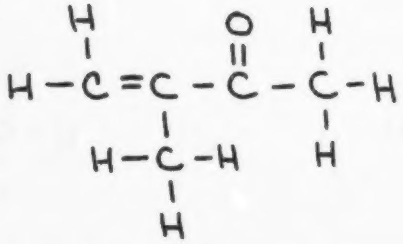
U140 Isobutyl alcohol



U159 methyl ethyl Ketone



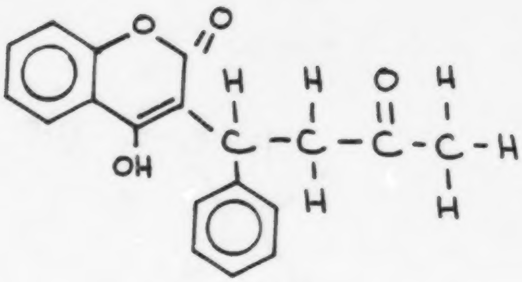
U161 methyl isobutyl Ketone
(isopropylacetone)



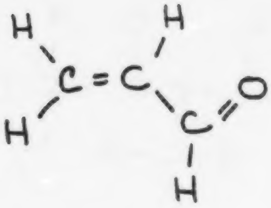
U162 Methyl methacrylate

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

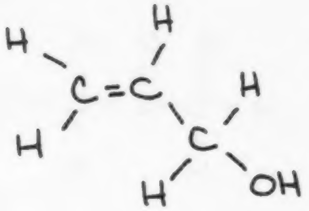
OXYGENATED HYDROCARBON AND HETEROCYCLIC WASTES (NONANALYZABLE)



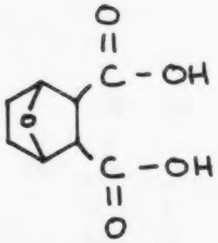
P001 Warfarin (>0.3%)
U248 Warfarin (≤ 0.3%)



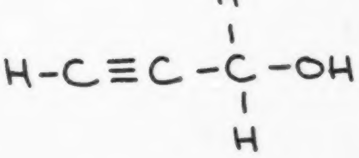
P003 Acrolein



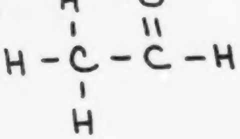
P005 allyl alcohol



P088 Endothall



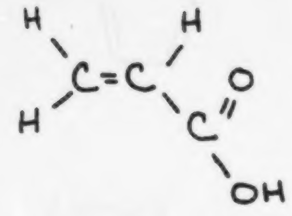
P102 Propargyl alcohol

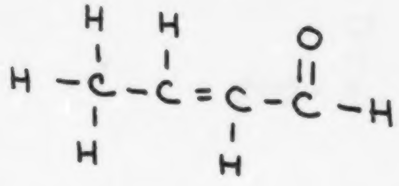


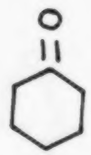
U001 Acetaldehyde

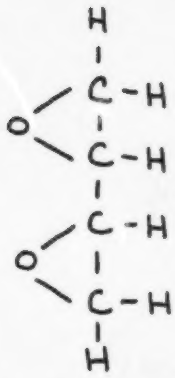
CHEMICAL STRUCTURES FOR U AND P WASTE CODES

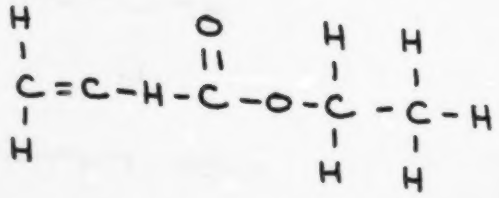
OXYGENATED HYDROCARBON AND HETEROCYCLIC WASTES (NONANALYZABLE) (Continued)

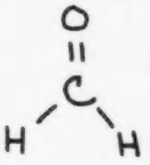

U008 Acrylic acid


U053 Crotonaldehyde


U057 Cyclohexanone

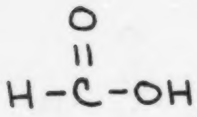

U085 1,2:3,4-Diepoxybutane (erythritol anhydride)


U113 Ethyl acrylate


U122 Formaldehyde

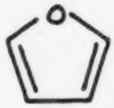
CHEMICAL STRUCTURES FOR U AND P WASTE CODES

OXYGENATED HYDROCARBON AND HETEROCYCLIC WASTES
(NONANALYZABLE) (Continued)

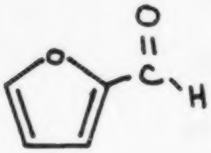


$H-\overset{\overset{O}{\|}}{C}-OH$

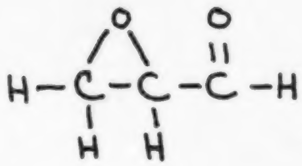
U123 Formic acid



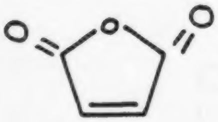
U124 Furan



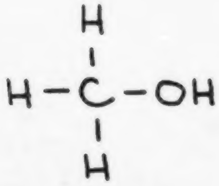
U125 Furfural



U126 Glycidylaldehyde



U147 maleic anhydride

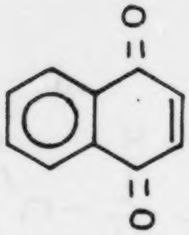


$H-\overset{\overset{H}{|}}{\underset{\underset{H}{|}}{C}}-OH$

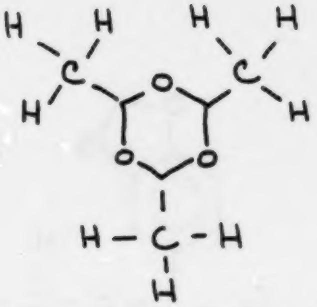
U154 Methanol

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

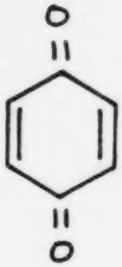
OXYGENATED HYDROCARBON AND HETEROCYCLIC WASTES (NONANALYZABLE) (Continued)



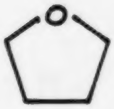
U166 1,4-Naphthoquinone



U182 Paraldehyde



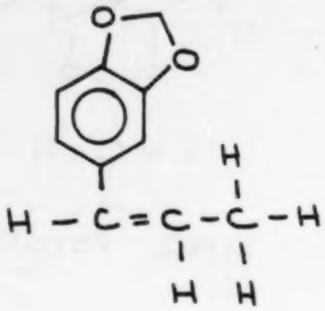
U197 p-Benzoquinone
(quinone)



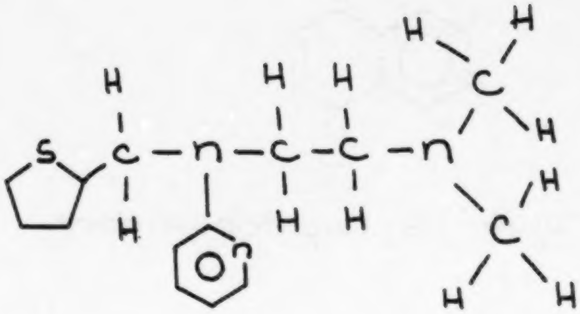
U213 Tetrahydrofuran

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

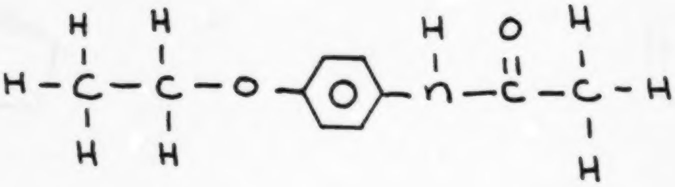
WASTES OF A PHARMACEUTICAL NATURE
(ANALYZABLE)



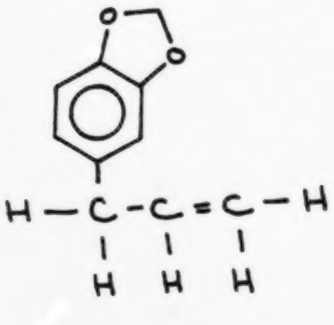
U141 Isosafrole



U155 methapyrilene



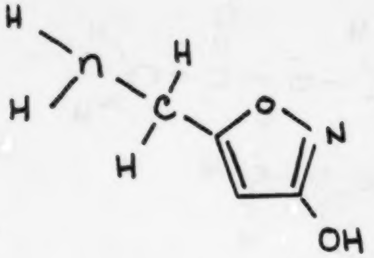
U187 Phenacetin



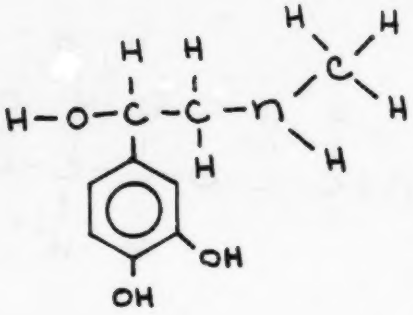
U203 Safrole

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

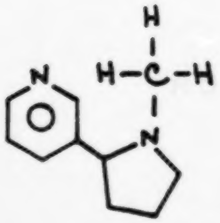
WASTES OF A PHARMACEUTICAL NATURE
(NONANALYZABLE)



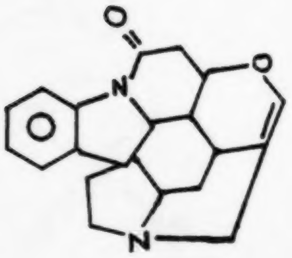
P007 5-aminomethyl-3-isoxazolol


H
H
H
H
H-O-C-C-N
H
H
OH
OH

P042 Epinephrine



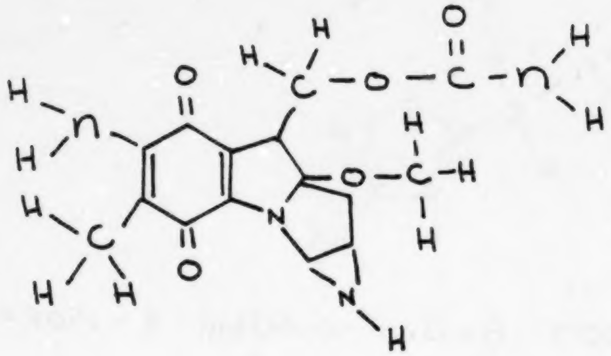
P075 Nicotine and Salts



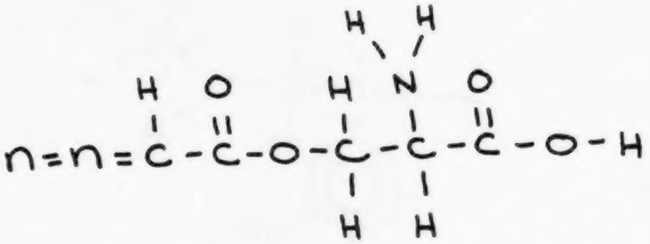
P108 Styrchnine and Salts

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

WASTES OF A PHARMACEUTICAL NATURE
(NONANALYZABLE) (Continued)

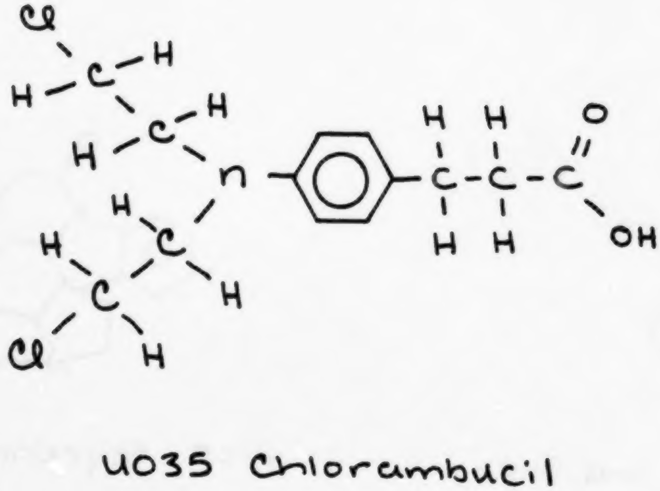


U010 mitomycin C



$$N{=}N{=}CH{-}C({=}O){-}O{-}CH_2{-}CH(NH_2){-}C({=}O){-}O{-}H$$

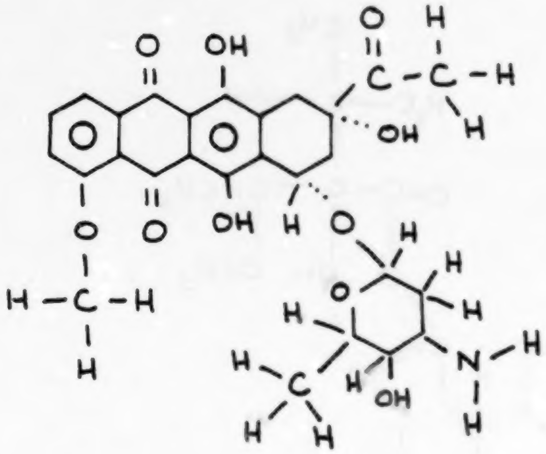
U015 azaserine



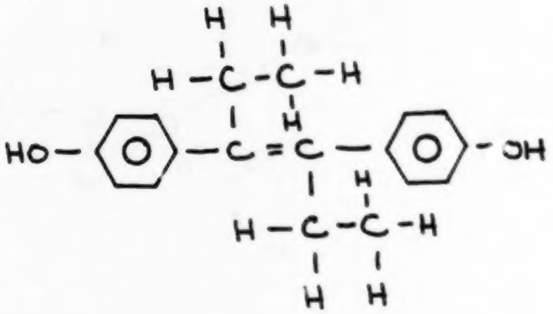
U035 Chlorambucil

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

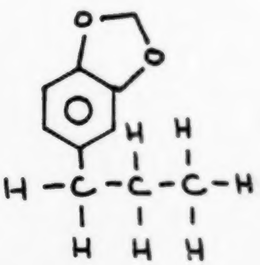
WASTES OF A PHARMACEUTICAL NATURE (NONANALYZABLE) (Continued)



U059 Daunomycin



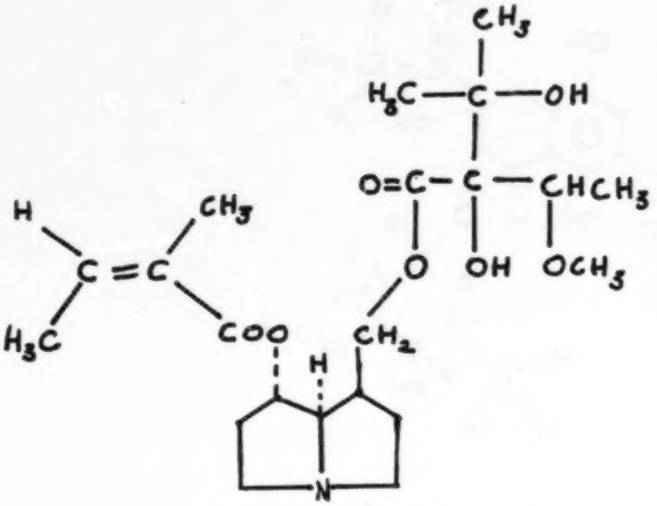
U089 Diethylstilbestrol



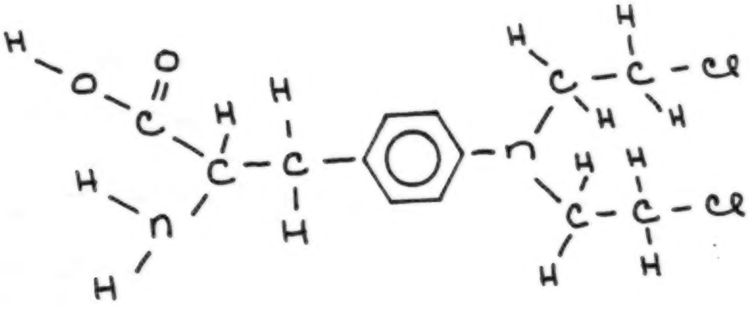
U090 Dihydrosafrole

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

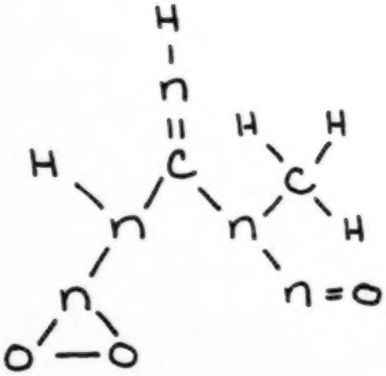
WASTES OF A PHARMACEUTICAL NATURE
(NONANALYZABLE) (Continued)



U143 Lasiocarpine



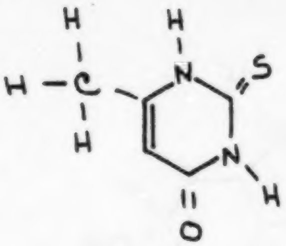
U150 melphalan



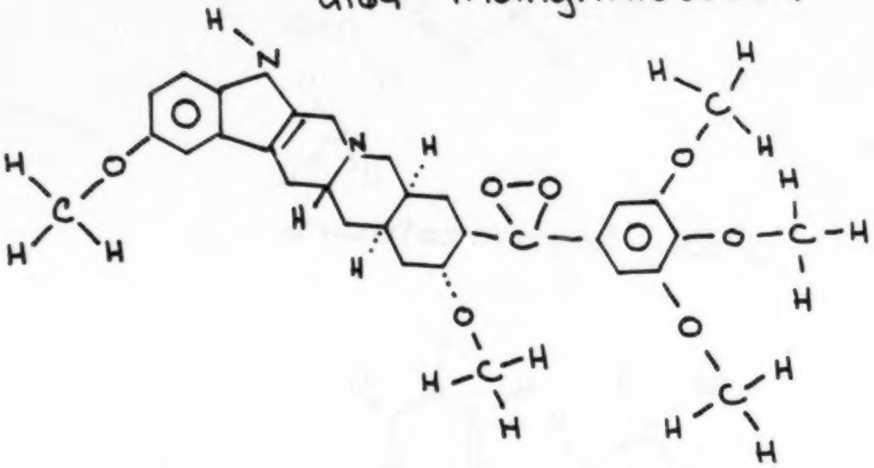
U163 n-methyl-, n-nitro-, n-nitrosoguanidine

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

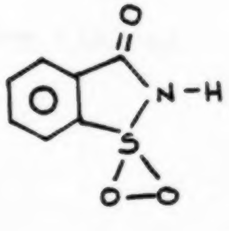
WASTES OF A PHARMACEUTICAL NATURE (NONANALYZABLE) (Continued)



U164 Methylthiouracil



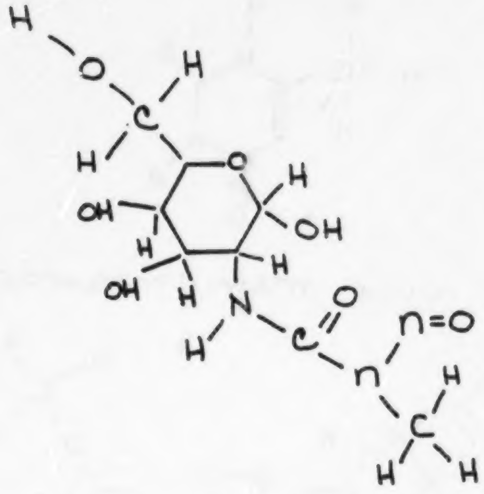
U200 Resperpine



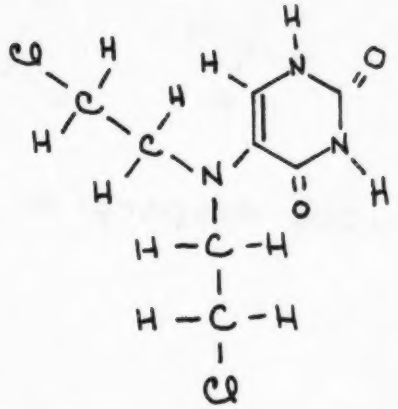
U202 Saccharin (and Salts)

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

WASTES OF A PHARMACEUTICAL NATURE (NONANALYZABLE) (Continued)



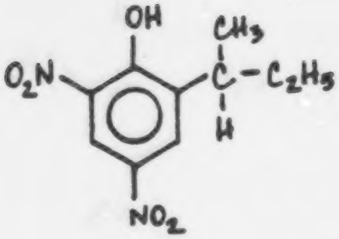
U206 Streptozotocin



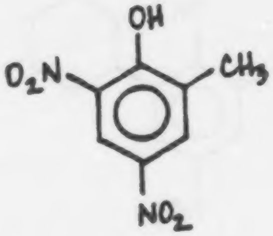
U237 Uracil mustard

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

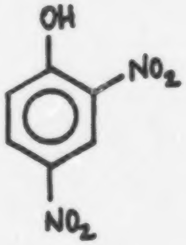
PHENOLICS
(ANALYZABLE)


OH
CH3
O2N
C
C2H5
H
NO2

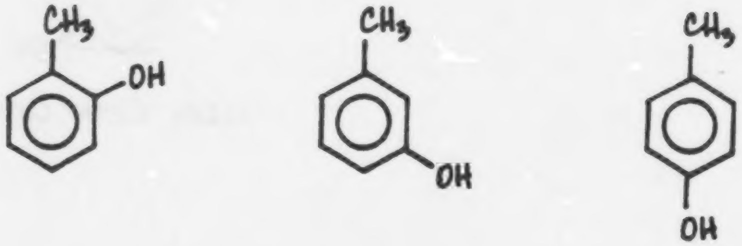
P020 2-sec-Butyl-4,6-dinitrophenol
(Dinoseb)


OH
O2N
CH3
NO2

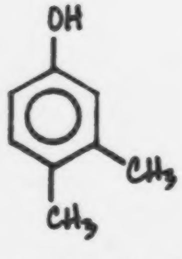
P047 4,6-Dinitro-o-cresol



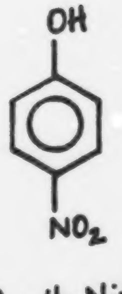
P048 2,4-Dinitrophenol


CH3
OH
CH3
OH
CH3
OH

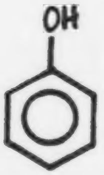
U052 Cresols (o-, m-, and p- isomers)



U101 2,4-Dimethylphenol



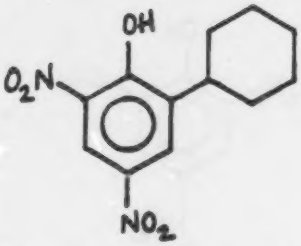
U170 4-Nitrophenol



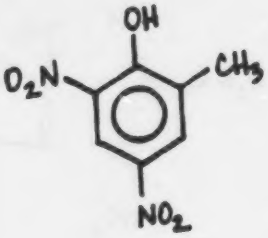
U188 Phenol

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

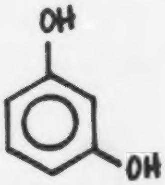
PHENOLICS
(NONANALYZABLE)



P034 2-Cyclohexyl-4,6-dinitrophenol


OH
O2N
CH3
NO2

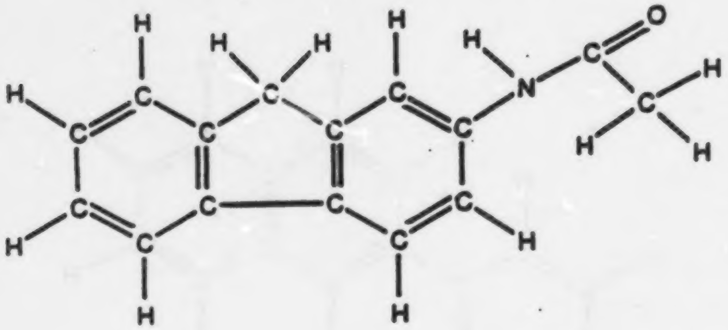
P047 4,6-Dinitro-o-cresol salts



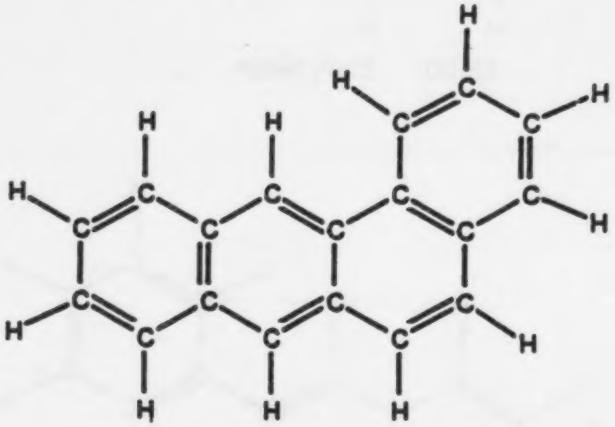
U201 Resorcinol

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

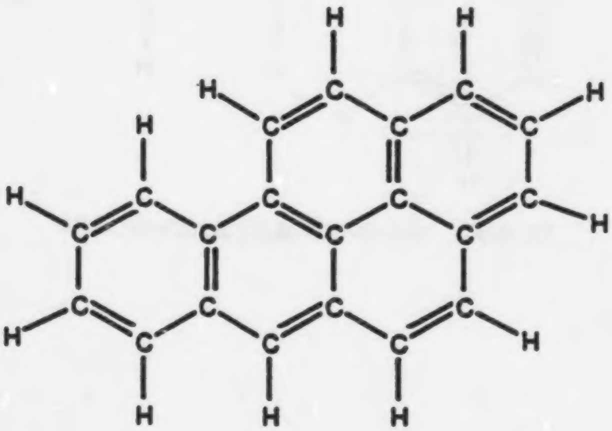
POLYNUCLEAR AROMATIC WASTES
(ANALYZABLE)



U005: 2-Acetylaminofluorene

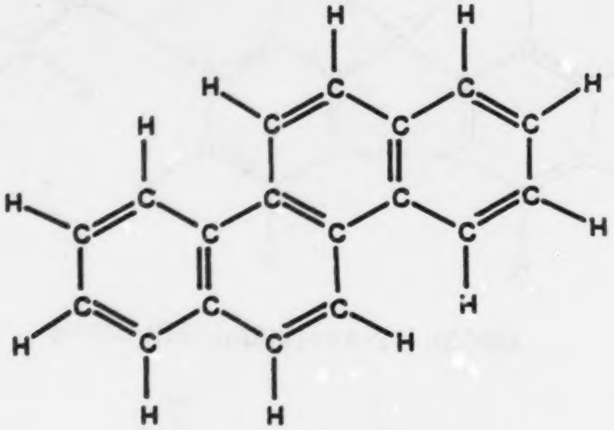


U018: Benz(a)Anthracene

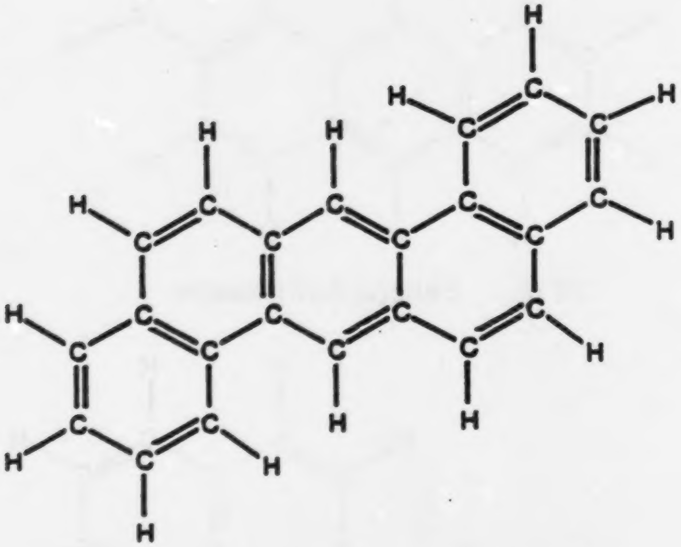


U022: Benzo(a)pyrene

POLYNUCLEAR AROMATIC WASTES (ANALYZABLE) (Continued)

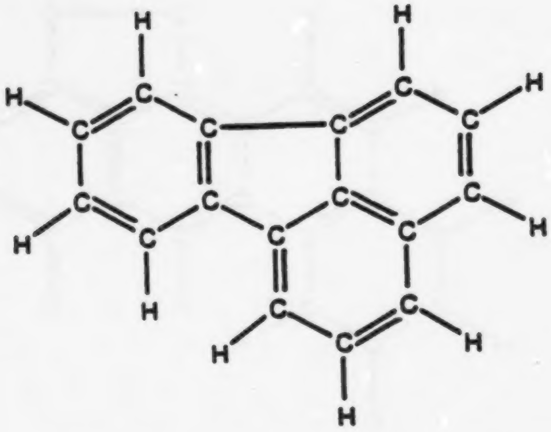


U050: Chrysene

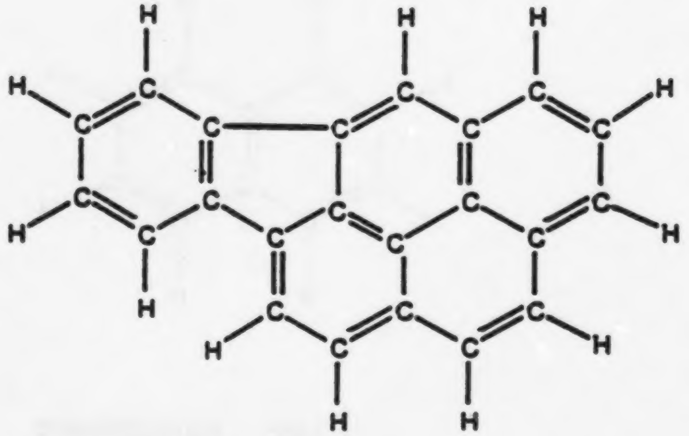


U063: Dibenzo(a,h) Anthracene

POLYNUCLEAR AROMATIC WASTES
(ANALYZABLE) (Continued)

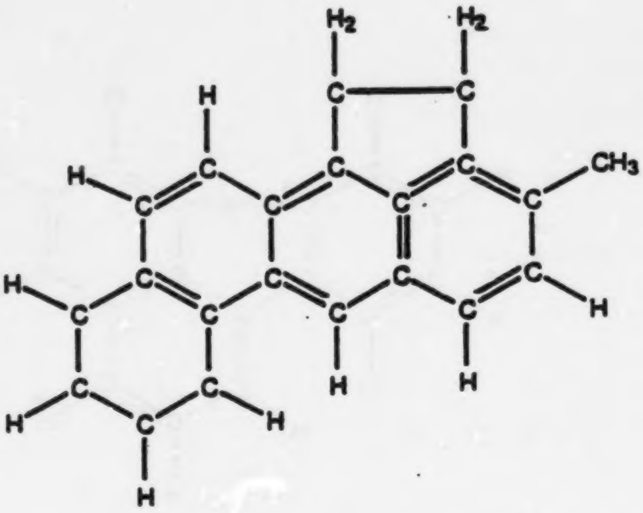


U120: Fluoranthene

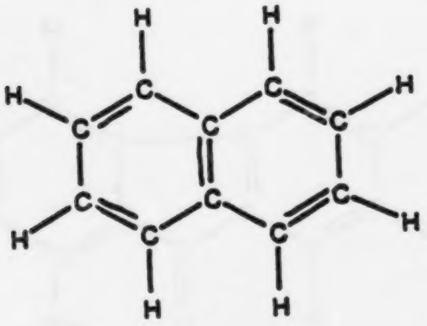


U137: Indeno(1,2,3-c,d)pyrene

POLYNUCLEAR AROMATIC WASTES (ANALYZABLE) (Continued)



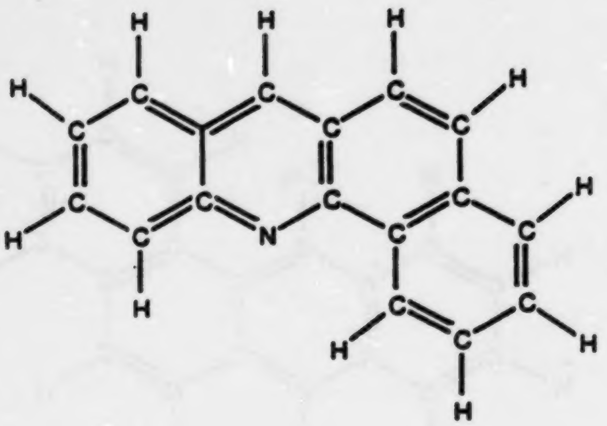
U157: 3-Methylcholanthrene



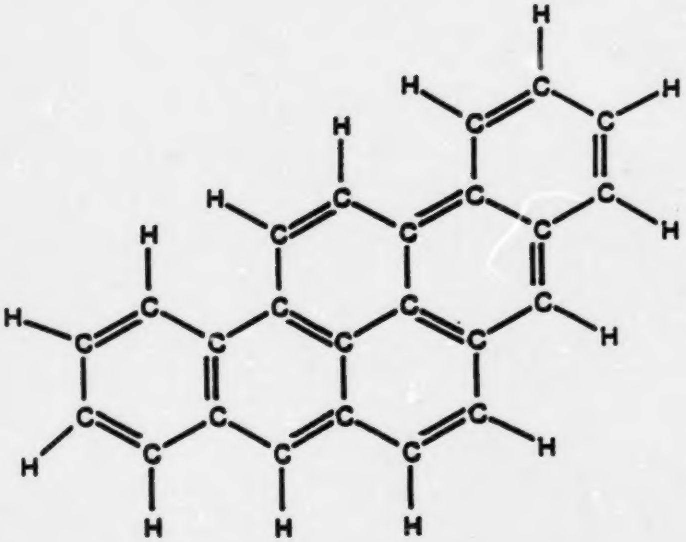
U165: Naphthalene

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

POLYNUCLEAR AROMATIC WASTES (NONANALYZABLE)

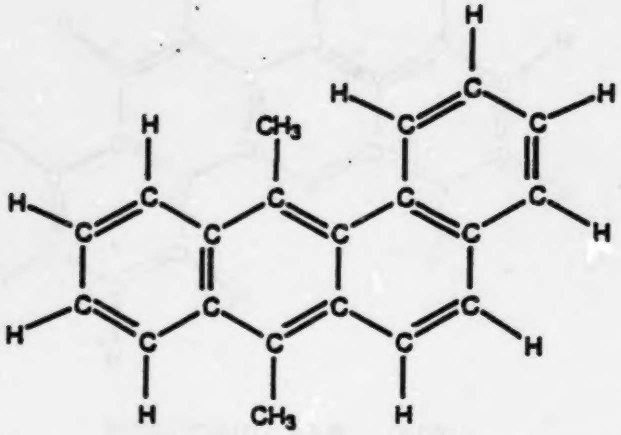


U016: Benz(c)Acridine



U064: 1,2,7,8-Dibenzopyrene

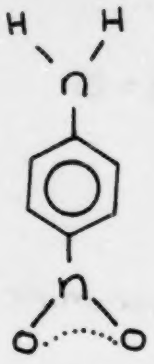
POLYNUCLEAR AROMATIC WASTES
(NONANALYZABLE) (Continued)



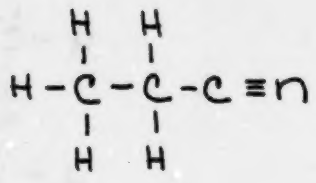
U094: 7,12-Dimethylbenz(a)anthracene

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

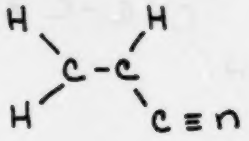
ORGANO-NITROGEN COMPOUND WASTES
(ANALYZABLE)



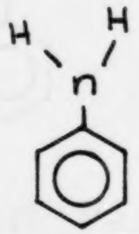
P077 P-Nitroaniline



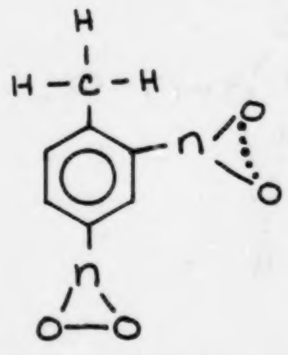
P101 Ethyl cyanide
(Propanenitrile)



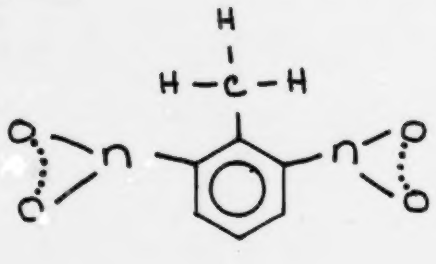
U009 acrylonitrile



U012 aniline



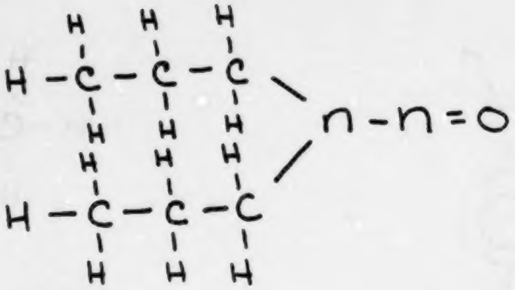
U105 2,4-Dinitrotoluene



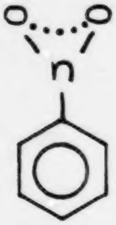
U106 2,6-Dinitrotoluene

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

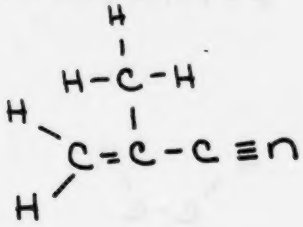
ORGANO-NITROGEN COMPOUND WASTES (ANALYZABLE) (Continued)



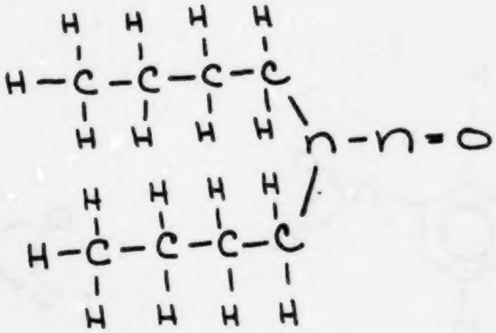
U111 Di-n-propylnitrosamine



U169 nitrobenzene



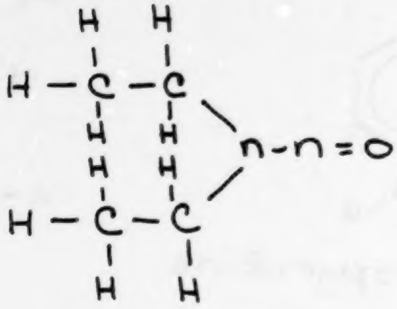
U152 Methacrylonitrile



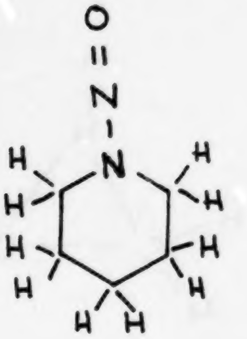
U172 n-nitroso-di-n-butyl-amine

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

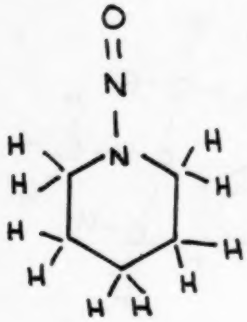
ORGANO-NITROGEN COMPOUND WASTES (ANALYZABLE) (Continued)



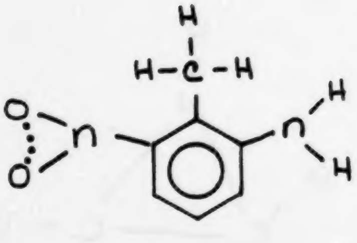
U174 n-Nitrosodiethylamine



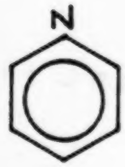
U179 n-Nitrosopiperidine



U180 n-Nitrosopyrrolidine



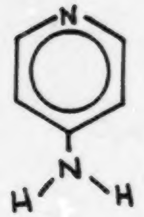
U181 5-Nitro-o-toluidine



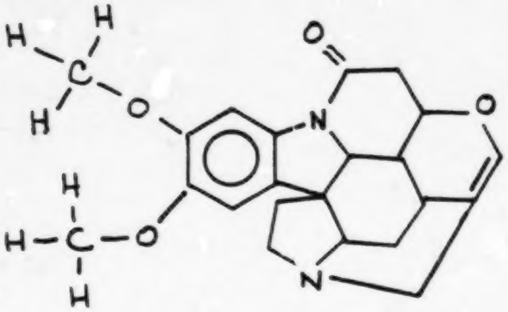
U196 Pyridine

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

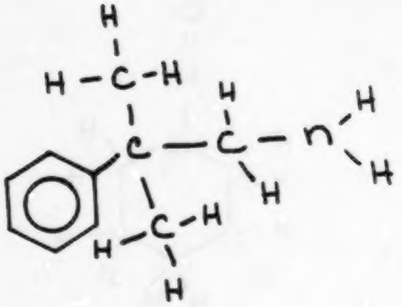
ORGANO-NITROGEN COMPOUND WASTES (NONANALYZABLE)



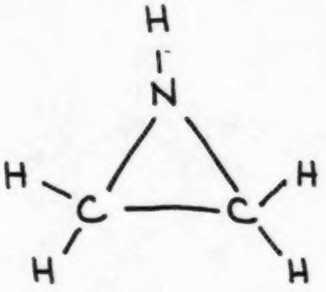
P008 4-aminopyridine



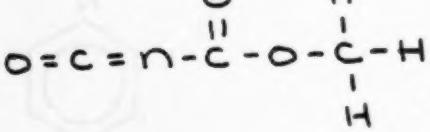
P018 Brucine



P046 alpha, alpha-dimethylphenethylamine

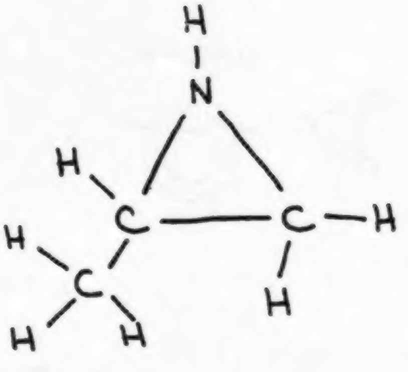


P054 aziridine



$O{=}C{=}N{-}\overset{\overset{O}{\|}}{C}{-}O{-}\underset{H}{\overset{H}{C}}{-}H$

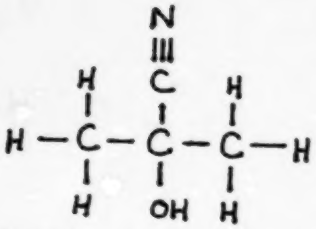
P064 Isocyanic acid, methyl ester



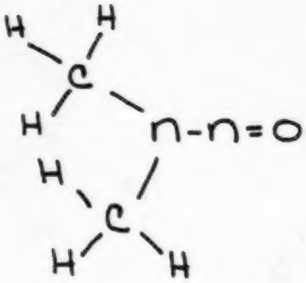
P067 2-methylaziridine

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

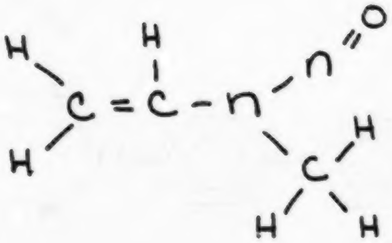
ORGANO-NITROGEN COMPOUND WASTES (NONANALYZABLE) (Continued)



P069 METHYLLACTONITRILE

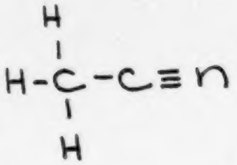


P082 n-nitrosodimethylamine

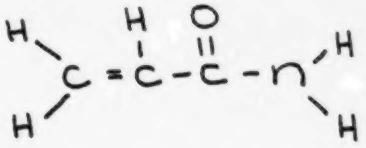


P084 N-Nitrosodimethylamine

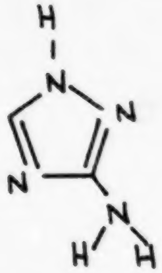
ORGANO-NITROGEN COMPOUND WASTES (NONANALYZABLE) (Continued)



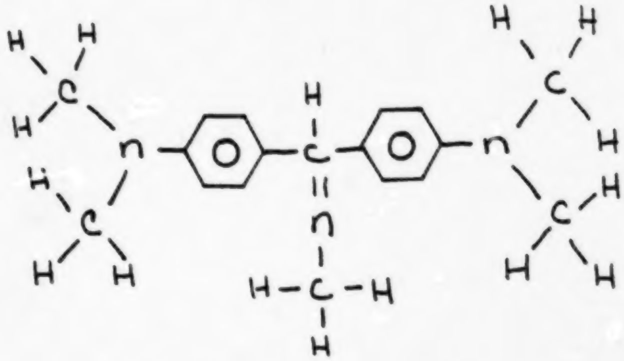
U003 Acetonitrile



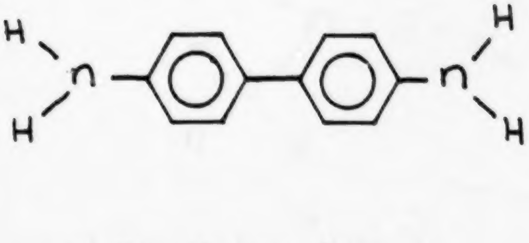
U007 Acrylamide



U011 Amitrole



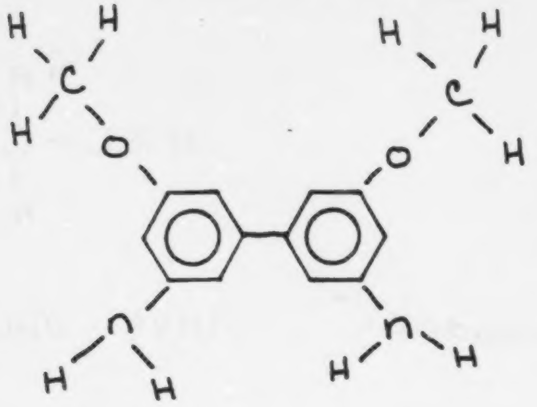
U014 Auramine



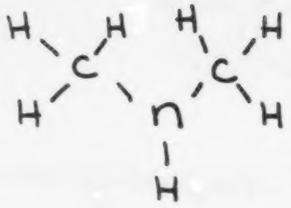
U021 Benzidine

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

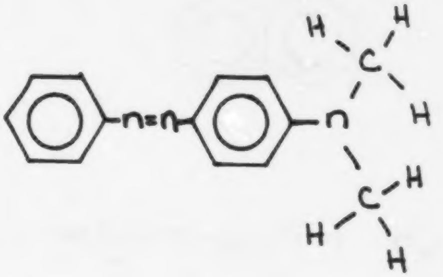
ORGANO-NITROGEN COMPOUND WASTES (NONANALYZABLE) (Continued)



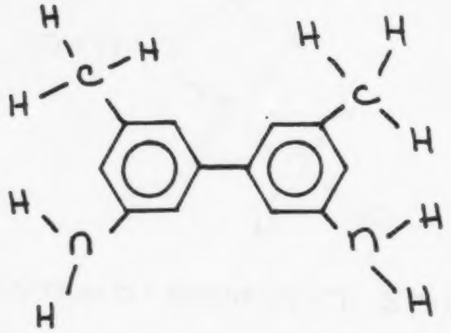
U091 3,3'-Dimethoxybenzidine



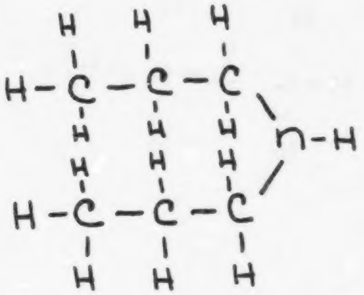
U092 Dimethylamine



U093 P-Dimethylamino-azobenzene



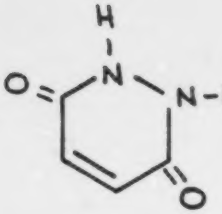
U095 3,3'-Dimethylbenzidine



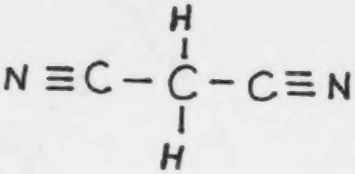
U110 Dipropylamine

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

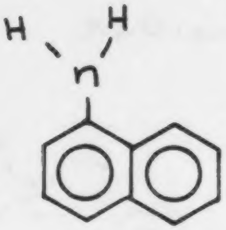
ORGANO-NITROGEN COMPOUND WASTES (NONANALYZABLE) (Continued)



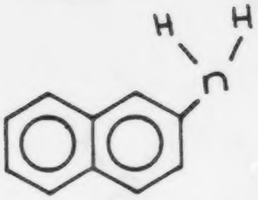
U148 maleic anhydride



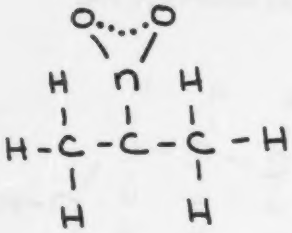
U149 MALONONITRILE



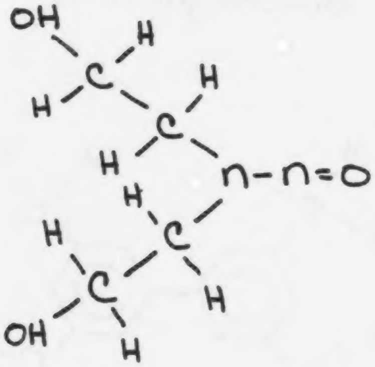
U167 1-naphthylamine



U168 2-naphthylamine


O....O
H n H
H-C-C-C-H
H H

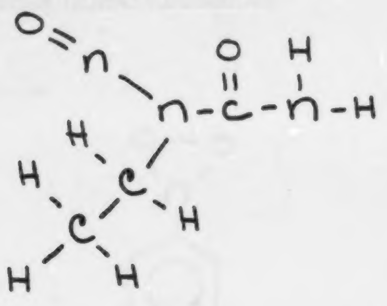
U171 2-nitropropane


OH
H
C
H
H
C
H
n-n=O
H
H
C
H
C
H
OH
H

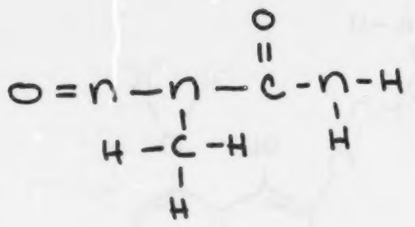
U173 n-nitroso-diethanolamine

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

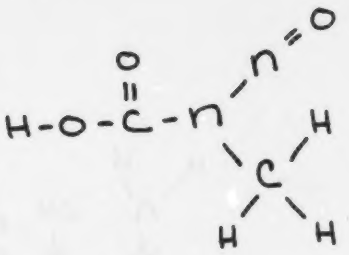
ORGANO-NITROGEN COMPOUND WASTES (NONANALYZABLE) (Continued)



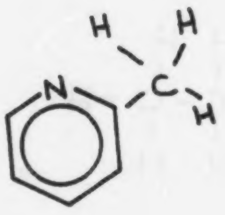
u176 n-nitroso-n-ethylurea



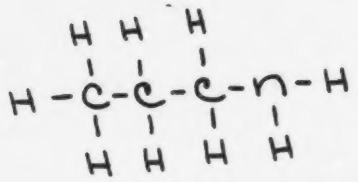
u177 n-nitroso-n-methylurea



u178 n-nitroso-n-methylurethane



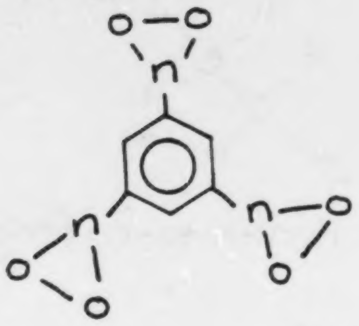
u191 2-picoline



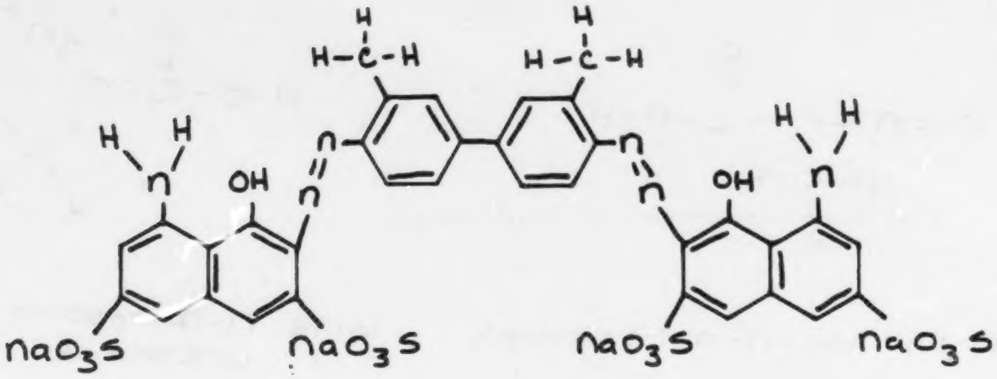
u194 n-Propylamine

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

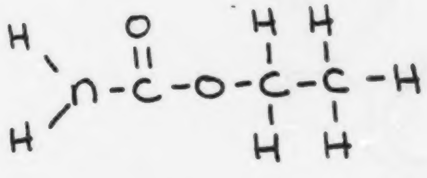
ORGANO-NITROGEN COMPOUND WASTES (NONANALYZABLE) (Continued)



U234 Sym-Trinitrobenzene


naO3S
naO3S
naO3S
naO3S

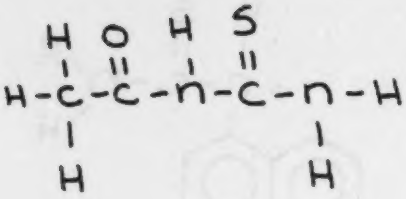
U236 Trypan Blue



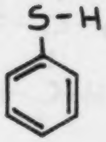
U238 Ethyl carbamate

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

ORGANO-SULFUR COMPOUND WASTES
(NONANALYZABLE)



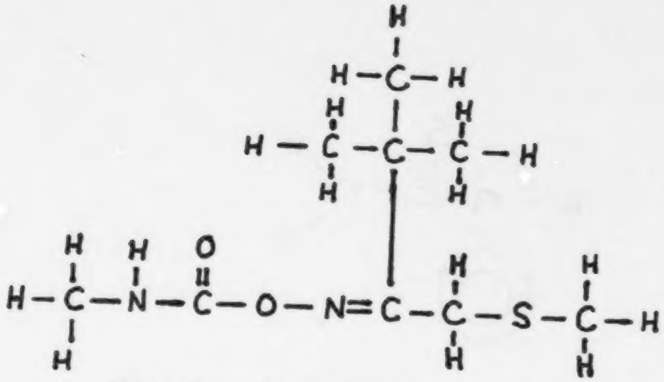
P002 1-acetyl, 2-thiourea



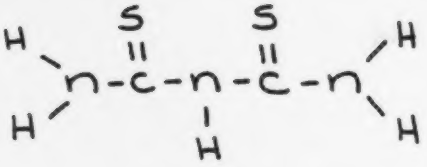
P014 Thiophenol

S=C=S

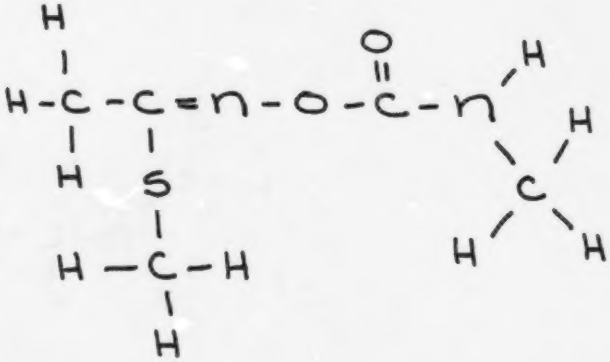
P022 Carbon disulfide



P045 THIOFANOX



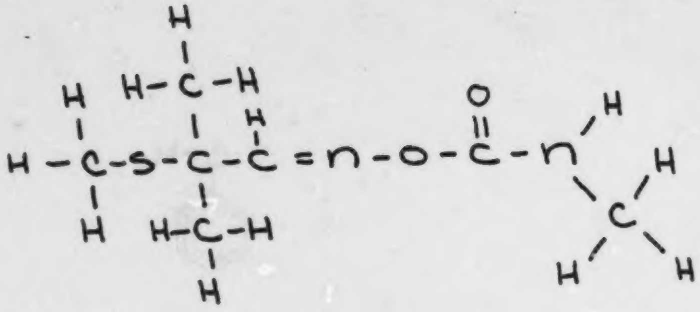
P049 2,4-Dithiobiuret



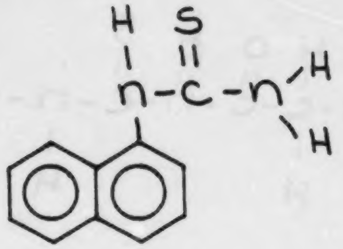
P066 Methomyl

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

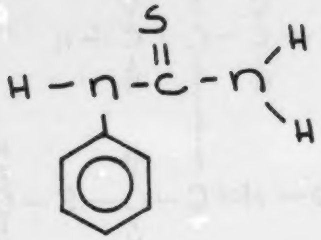
ORGANO-SULFUR COMPOUND WASTES (NONANALYZABLE) (Continued)



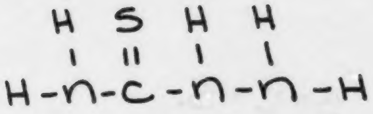
P070 aldicarb



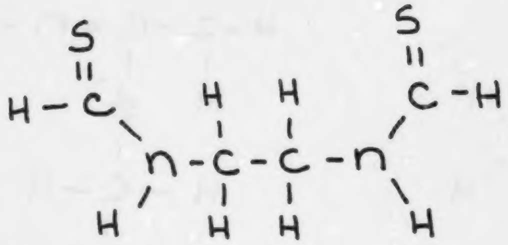
P072 1-naphthyl-2-thiourea



P093 n-Phenylthiourea



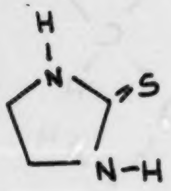
P116 Thiosemicarbazide



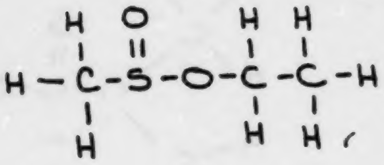
U114 Ethylene bis-dithiocarbamic acid

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

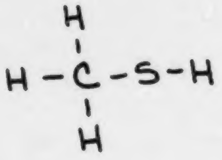
ORGANO-SULFUR COMPOUND WASTES (NONANALYZABLE) (Continued)



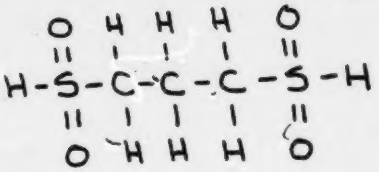
U116 Ethylene thiourea



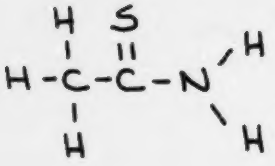
U119 Ethyl methane sulfonate



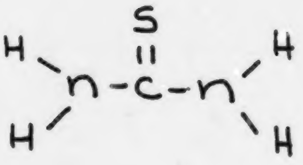
U153 methanethiol



U193 1,3-Propane sultone



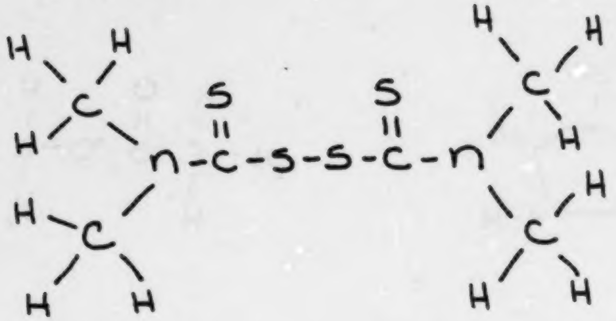
U218 Thiocetamide



U219 Thiourea

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

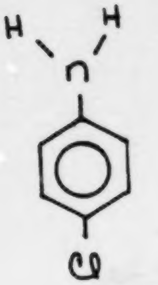
ORGANO-SULFUR COMPOUND WASTES
(NONANALYZABLE) (Continued)



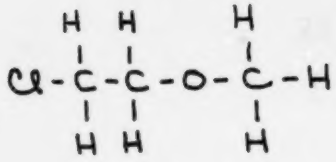
U244 Thiram

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

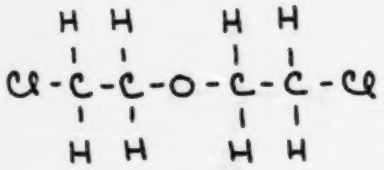
MISCELLANEOUS HALOGENATED ORGANIC WASTES
(ANALYZABLE)



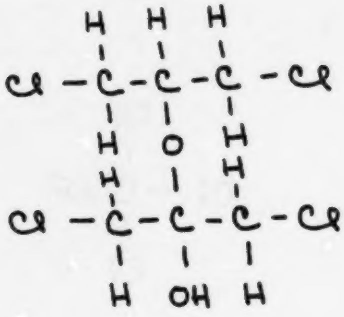
P024 p-Chloroaniline



U024 Bis-(2-chloroethoxy) methane



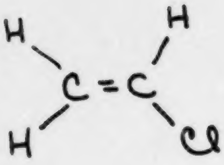
U025 Dichloroethyl ether



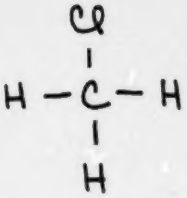
U027 Bis-(2-chloroisopropyl) ether

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

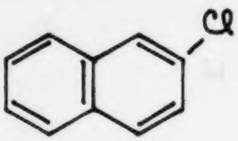
MISCELLANEOUS HALOGENATED ORGANIC WASTES (ANALYZABLE) (Continued)



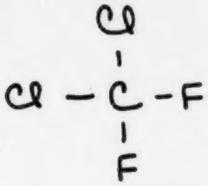
U043 Vinyl chloride



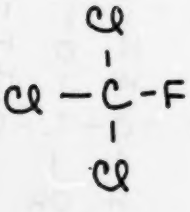
U045 Chloromethane



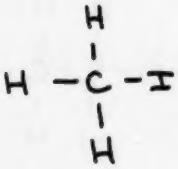
U047 2-Chloronaphthalene



U075 Dichlorodifluoromethane



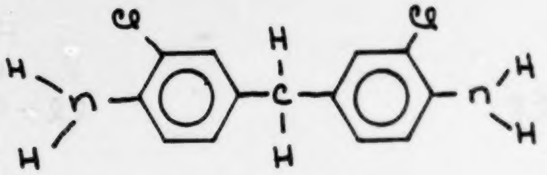
U121 Trichloromonofluoromethane



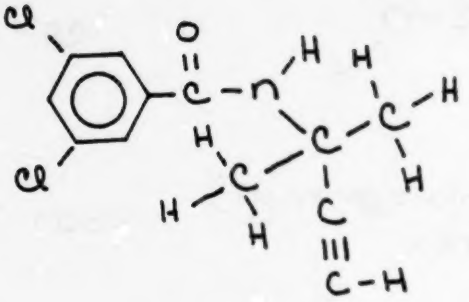
U138 Iodomethane

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

MISCELLANEOUS HALOGENATED ORGANIC WASTES (ANALYZABLE) (Continued)



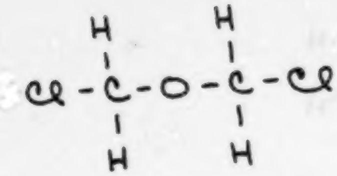
U158 4,4 Methylene-bis-(2-chloro- aniline)



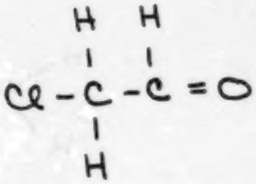
U192 Pronamide

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

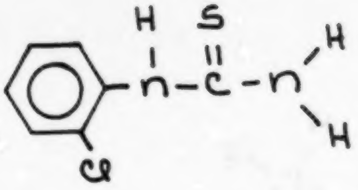
MISCELLANEOUS HALOGENATED ORGANIC WASTES
(NONANALYZABLE)



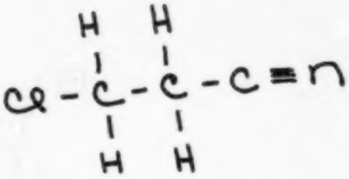
P016 Bis (chloromethyl) ether



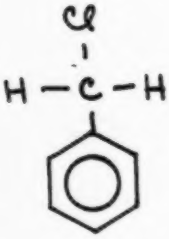
P023 Chloroacetaldehyde



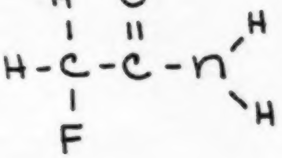
P026 1-(o-Chlorophenyl) thiourea



P027 3-Chloropropionitrile



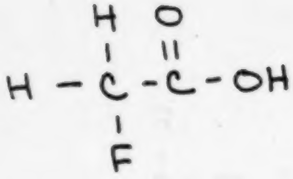
P028 Benzyl chloride



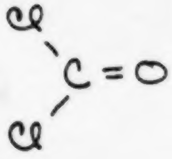
P057 2-Fluoroacetamide

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

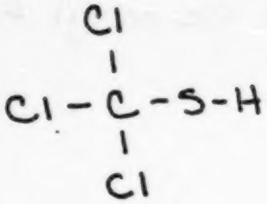
MISCELLANEOUS HALOGENATED ORGANIC WASTES (NONANALYZABLE) (Continued)



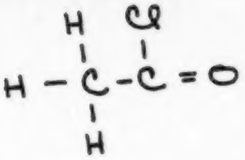
P058 Fluoroacetic acid



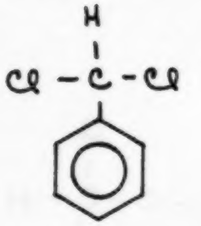
P095 Phosgene



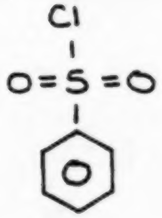
P118 Trichloromethanthiol



U006 Acetyl chloride



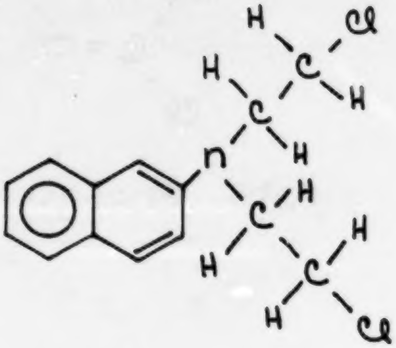
U017 Benzal chloride



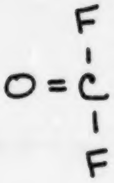
U020 Benzenesulfonyl chloride

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

MISCELLANEOUS HALOGENATED ORGANIC WASTES (NONANALYZABLE) (Continued)

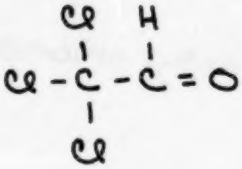


U026 Chlornaphazine



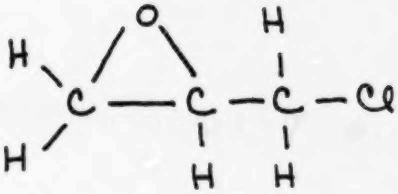
$\mathrm{O{=}CF_2}$

U033 Carbonyl fluoride

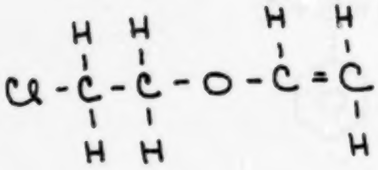


$\mathrm{Cl{-}CCl_2{-}CH{=}O}$

U034 Trichloroacetaldehyde

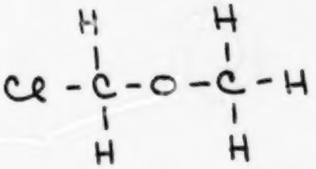


U041 1-Chloro-2,3-epoxypropane



$\mathrm{Cl{-}CH_2{-}CH_2{-}O{-}CH{=}CH_2}$

U042 2-Chloroethyl vinyl ether

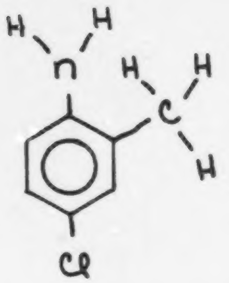


$\mathrm{Cl{-}CH_2{-}O{-}CH_3}$

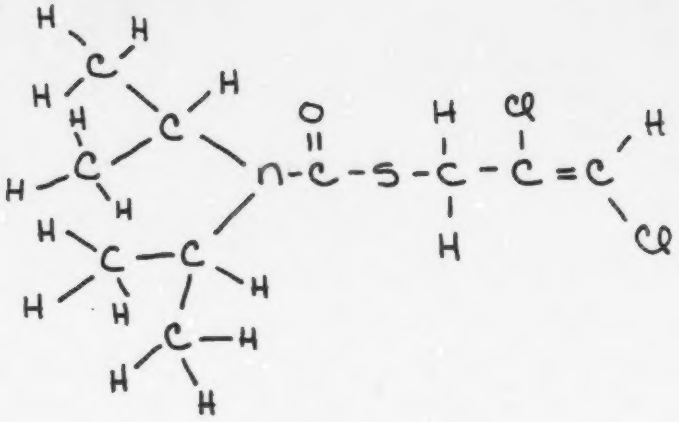
U046 Chloromethyl methyl ether

CHEMICAL STRUCTURES FOR U AND P WASTE CODES

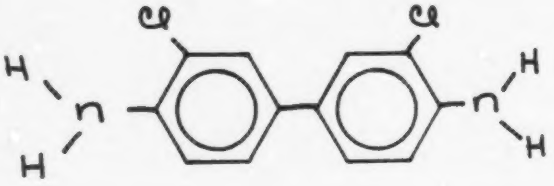
MISCELLANEOUS HALOGENATED ORGANIC WASTES (NONANALYZABLE) (Continued)



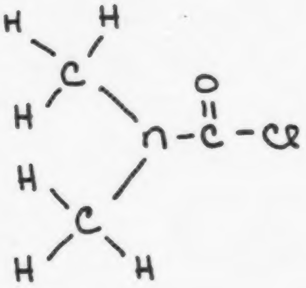
U049 4-Chloro-o-toluidine hydrochloride



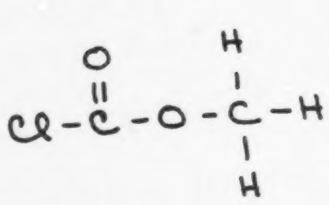
U062 Diallate



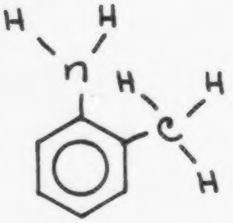
U073 3,3′-Dichlorobenzidine



U097 Dimethylcarbamoyl chloride



U156 methyl chlorocarbonate



U222 o-Toluidine hydrochloride

APPENDIX C

SUPPLEMENTAL TREATMENT PERFORMANCE DATA

Table C-1

WASTE CONSTITUENTS DETECTED IN THE UNTREATED OR TREATED WASTES IN ONE OR MORE OF THE FOURTEEN INCINERATION TESTS

Waste Code	BDAT Number	Waste Constituent	Detected In Treatment Test Number*	Concentration In Untreated Waste (ppm)	Concentration In Ash (ppm)[# of sample sets]**	Concentration In Scrubber Water (ppm)[# of sample sets]**
AROMATIC WASTES						
U019	4	Benzene	2	51 - 83	<10 [7]	<0.010 [7]
			3	48 - 61	<2.0 [6], 6.9 [1]	<0.002 [7]
			5	<2.0 - 3.0	<2.0 [1], 3.0 [2]	<0.002 [4], 0.002 [1], 0.003 [1]
			8	5.6 - 212	<0.025 [5]	<0.005 [8]
U220	43	Toluene	1	10 - 41	<2.0 [3]	<0.002 [3]
			2	100 - 170	<10 [7]	<0.010 [7]
			3	2.3 - 3.6	<2.0 [7]	<0.002 [7]
			4	<2,000	<2.0 [6]	<0.002 [3], 0.0026 [1], 0.0032 [1], 0.0046 [1]
			5	<2.0 - 5.0	2.0 [2], 8.0 [1]	<0.002 [3], 0.002 [1], 0.003 [1], 0.004 [1]
			6	201 - 2,000	<2.0 [6]	<0.002 [8]
			7	22 - 120	<2.0 [5], 3.0 [1]	<0.004 [6]
			8	5.0 - 152	<0.025 [2], 0.085 [1], 0.15 [1], 0.19 [1]	<0.005 [5], 0.008 [2], 0.009 [1]
			9	<25 - 42	<0.005 [4]	<0.005 [4]
			10	5.4 - 23	<1.5 [4]	<0.005 [6]
			13	0.021	<0.005 [3], <0.01 [1]	<0.005 [3]
			14	69,000	<0.01 [4]	<0.005 [4]
U239	215/ 216/ 217	Xylenes (total)	1	12 - 130	<2.0 [3]	<0.002 [3]
			2	120 - 170	<10 [7]	<0.010 [7]
			3	<2.0 - 7.2	<2.0 [7]	<0.002 [7]
			5	<2.0	<2.0 [3]	<0.002 [5], 0.004 [1]
			7	<14 - 120	<2.0 [5], 5.8 [1]	<0.004 [6]
			8	3.0 - 123	<0.025 [5]	<0.005 [8]
			10	<1.5 - 5.3	<1.5 [4]	<0.005 [6]
HALOGENATED ALIPHATIC WASTES						
U044	14	Chloroform	3	<2.0	<2.0 [7]	0.0021 [1], 0.0029 [2], 0.0030 [1], 0.0031 [1], 0.0036 [2]
			4	4,600 - 6,000	<2.0 [6]	<0.002 [6]
U076	22	1,1-Dichloroethane	4	<2,000 - 2,200	<2.0 [6]	<0.002 [6]
U077	23	1,2-Dichloroethane	4	87,000 - 130,000	<2.0 [6]	<0.002 [6]
			11	<0.025 - 11,000	<0.005 [6]	<0.005 [6]
U080	38	Methylene chloride	1	<10	<10 [3]	<0.010 [2], 0.061 [1]
			13	<6,300	<0.005[1], 0.090[1], 0.012[1], 0.015[1]	<0.005 [4]
			14	87,000	<0.010 [3], 0.016 [1]	<0.005 [4]
U083	26	1,2-Dichloropropane	11	<0.025 - 230,000	<0.005 [6]	<0.005 [6]
U084	28	cis-1,3-Dichloropropylene	11	<0.025 - 160,000	<0.005 [6]	<0.005 [6]
U084	27	trans-1,3-Dichloropropylene	11	<0.025 - 290,000	<0.005 [6]	<0.005 [6]

* - Treatment tests are identified by number in Table 4-1. Data from Tests 3, 5, and 6 were not used to calculate treatment standards.

** - Number in brackets indicates the number of sample sets for which that value was reported.

Table C-1 (Continued)

WASTE CONSTITUENTS DETECTED IN THE UNTREATED OR TREATED WASTES IN ONE OR MORE OF THE FOURTEEN INCINERATION TESTS

Waste Code	BDAT Number	Waste Constituent	Detected In Treatment Test Number*	Concentration In Untreated Waste (ppm)	Concentration In Ash (ppm)[# of sample sets]**	Concentration In Scrubber Water (ppm)[# of sample sets]**
HALOGENATED ALIPHATIC WASTES (continued)						
U131	113	Hexachloroethane	4	85 - 120	<10 [6]	<0.010 [6]
			11	0.44	<0.333 [5], <0.351 [1]	<0.0121 [1], <0.0116 [1], <0.0108 [1], <0.0104 [1], <0.0106 [1], <0.0107 [1]
U209	41	1,1,2,2-Tetrachloroethane	5	2.0 - 3.0	2.0 [1], 3.0 [2]	<0.002 [6]
			6	<20	<2.0 [6]	<0.002 [7], 0.003 [1]
U210	42	Tetrachloroethylene	3	2.3 - 3.9	<2.0 [7]	<0.002 [7]
			4	6,000 - 7,800	<2.0 [6]	<0.002 [6]
			5	<2.0	<2.0 [3]	<0.002 [5], 0.003 [1]
			11	0.33	<0.005 [6]	<0.005 [6]
			13	0.023	<0.005 [3], <0.01 [1]	<0.005 [4]
U211	7	Carbon tetrachloride	4	3,500 - 4,100	<2.0 [6]	<0.002 [6]
			6	<20	<2.0 [6]	<0.002 [7], 0.0073 [1]
			13	0.017	<0.005[1], 0.008[1], <0.010[1], 0.048[1]	<0.005 [4]
U226	45	1,1,1-Trichloroethane	4	33,000 - 81,000	<2.0 [6]	<0.002 [6]
			14	130,000	<0.01 [4]	<0.005 [4]
U227	46	1,1,2-Trichloroethane	11	<0.025 - 860	<0.005 [6]	<0.005 [6]
U228	47	Trichloroethylene	4	2,200 - 3,210	<2.0 [6]	<0.002 [6]
HALOGENATED PESTICIDE AND CHLOROBENZENE WASTES						
P059	186	Heptachlor	13	16,000 - 88,000	<0.0066 [3], <0.0065 [1]	<0.00005[4]
U036	177	Chlordane (alpha and gamma)	13	6,600 - 44,900	<0.013 [4]	<0.0001[4]
U037	9	Chlorobenzene	4	<2,000 - 3,000	<2.0 [6]	<0.002[6]
			13	0.027	<0.005[1],<0.01[3]	<0.005[4]
U070	87	ortho-Dichlorobenzene	4	250	<2.0 [6]	<0.002 [6]
			11	302	<0.333 [5], <0.351 [1]	<0.0121 [1], <0.0116 [1], <0.0108 [1], <0.0104 [1], <0.0106 [1], <0.0107 [1]
U072	88	para-Dichlorobenzene	4	74 - 90	<2.0 [6]	<0.002 [6]
			11	2.08	<0.333 [5], <0.351 [1]	<0.0121 [1], <0.0116 [1], <0.0108 [1], <0.0104 [1], <0.0106 [1], <0.0107 [1]
U127	110	Hexachlorobenzene	4	60 - 87	<10 [6]	<0.01 [6]
			11	2.08	<0.333 [5], <0.351 [1]	<0.0121[1], <0.0116 [1], <0.0108 [1],
			13	13,000	<0.31 [1], <0.33 [2],< 0.36 [1]	<0.01 [2], <0.011 [2]

* - Treatment tests are identified by number in Table 4-1. Data from Tests 3, 5, and 6 were not used to calculate treatment standards.

** - Number in brackets indicates the number of sample sets for which that value was reported.

Table C-1 (Continued)

WASTE CONSTITUENTS DETECTED IN THE UNTREATED OR TREATED WASTES IN ONE OR MORE OF THE FOURTEEN INCINERATION TESTS

Waste Code	BDAT Number	Waste Constituent	Detected In Treatment Test Number*	Concentration In Untreated Waste (ppm)	Concentration In Ash (ppm)[# of sample sets]**	Concentration In Scrubber Water (ppm)[# of sample sets]**
HALOGENATED PESTICIDE AND CHLOROBENZENE WASTES (continued)						
U128	111	Hexachlorobutadiene	4	210	<10 [6]	<0.01 [6]
			13	22 - 230	<0.31 [1], <0.33 [2], <0.36 [1]	<0.01 [2], <0.011 [2]
U130	112	Hexachlorocyclopentadiene	13	120 - 1,800	<0.31 [1], <0.33 [2], <0.36 [1]	<0.01 [2], <0.011 [2]
U183	136	Pentachlorobenzene	4	51 - 65	<10 [6]	<0.01 [6]
			13	24	<0.31 [1], <0.33 [2], <0.36 [1]	<0.01 [2], <0.011 [2]
U185	138	Pentachloronitrobenzene	13	1,300	<0.33 [3], <0.36 [1]	<0.01 [2], <0.011 [2]
U207	148	1,2,4,5-Tetrachlorobenzene	4	62 - 88	<5.0 [6]	<0.005 [6]
U240	192	2,4-Dichlorophenoxyacetic acid	13	0.35 - 17	0.021 [1], <0.2 [3]	0.0041[1],0.0069[1],0.0074[1],0.011[1]
			14	0.35 - 17	<0.002 [2], 0.067 [1], 0.23 [1]	<0.00013 [4]
U247	190	Methoxychlor	13	50,000 - 190,000	<0.013 [4]	<0.0001 [4]
HALOGENATED PHENOLIC WASTES						
U081	90	2,4-Dichlorophenol	4	420	<5.0 [6]	<0.005 [6]
			13	140	<0.31 [1], <0.33 [2], <0.36 [1]	<0.01 [2], <0.011 [2]
U082	91	2,6-Dichlorophenol	4	430 - 500	<5.0 [6]	<0.005 [6]
OXYGENATED HYDROCARBON AND HETEROCYCLIC WASTES						
U002	222	Acetone	3	0.081 - 0.095	<0.05 [7]	<0.05 [6]
			9	<50 - 81	<0.01 [3]	<0.01 [4]
			11	<0.05 - 21,000	<0.01 [6]	<0.01 [6]
			13	0.055	<0.01 [3], 0.02 [1]	<0.01 [4]
U112	225	Ethyl acetate	5	<250	<2.0 [3]	<0.002 [7], 0.036 [1], 0.019 [1], 0.020 [1]
U159	34	Methyl ethyl ketone	4	<1,000 - 10,000	<10 [6]	<0.01 [6]
			5	200 - 600	1100 [1], 780 [1], 460 [1]	<0.01 [10]
			6	<500	385[1],540[1],640[1],380[1],<50[1],<50[1]	<0.050 [6]
			8	<2.0 - 10	<0.025 [5]	<0.010 [5], 0.014 [1]
			11	2,200	<0.010 [6]	<0.01 [6]
U161	229	Methyl isobutyl ketone	1	0.016	<10 [3]	<0.01 [6]
			14	52,000	<0.020 [4]	<0.01 [4]

* - Treatment tests are identified by number in Table 4-1. Data from Tests 3, 5, and 6 were not used to calculate treatment standards.

** - Number in brackets indicates the number of sample sets for which that value was reported.

Table C-1 (Continued)

WASTE CONSTITUENTS DETECTED IN THE UNTREATED OR TREATED WASTES IN ONE OR MORE OF THE FOURTEEN INCINERATION TESTS

Waste Code	BDAT Number	Waste Constituent	Detected In Treatment Test Number*	Concentration In Untreated Waste (ppm)	Concentration In Ash (ppm)[# of sample sets]**	Concentration In Scrubber Water (ppm)[# of sample sets]**
WASTES OF A PHARMACEUTICAL NATURE						
U141	117	Isosafrole	14	35,000	<0.36 [1], <0.33 [3]	<0.013 [4]
PHENOLIC WASTES						
P020	73	2-sec-Butyl-4,6-dinitrophenol	14	77,000	<0.33 [3], <0.36 [1]	<0.013 [1]
U052	81	o-Cresol	4	20	<2.0 [6]	<0.002 [6]
U052	82	Cresol (m- and p- isomers)	8	894 - 1,026	<1.0 [5]	<0.010 [6]
U188	142	Phenol	2	2,400 - 3,900	<0.10 [6]	<0.002 [6]
			4	78	<2.0 [6]	<0.002 [6]
			8	894 - 1,026	<1.0 [5]	<0.010 [6]
			10	0.010	<1.0 [4]	0.015 [1], 0.017 [2], 0.019 [1], 0.022 [1], 0.023 [1]
			11	1,842	<0.333 [5], <0.351 [1]	<0.0121 [1], <0.0116 [1], <0.0108 [1], <0.0104 [1], <0.0106 [1], <0.0107 [1]
			14	13,000	<0.33 [3], <0.36 [1]	<0.013 [4]
POLYNUCLEAR AROMATIC WASTES						
U018	59	Benz(a)anthracene	1	1,900 - 3,400	<0.5 [3]	<0.010 [4]
			2	4,000 - 4,600	<0.52 [7]	<0.008 [7]
			7	<20 - 29	<0.2 [6]	<0.01 [6]
			8	5,400 - 7,500	<1.0 [5]	<0.010 [8]
			11	<0.351 - 0.89	<0.333 [5], <0.351 [1]	<0.0104 [1], <0.0106 [1], <0.0107 [1], <0.0108 [1], <0.0116 [1], <0.0121 [1]
U022	62	Benzo(a)pyrene	1	<500 - 940	<0.5 [3]	<0.010 [4]
			2	1,600 - 1,900	<0.17 [7]	<0.003 [7]
			8	3,800 - 5,400	<1.0 [5]	<0.010 [8]
			11	<0.351 - 0.60	<0.333 [5], <0.351 [1]	<0.0104 [1], <0.0106 [1], <0.0107 [1], <0.0108 [1], <0.0116 [1], <0.0121 [1]
U050	80	Chrysene	1	1,900 - 3,600	<0.5 [3]	<0.010 [4]
			2	4,100 - 4,800	<0.17 [7]	<0.003 [7]
			7	<20 - 51	<0.2 [6]	<0.010 [6]
			8	4,700 - 6,500	<1.0 [5]	<0.010 [8]
			11	<0.351 - 1.06	<0.333 [5], <0.351 [1]	<0.0104 [1], <0.0106 [1], <0.0107 [1], <0.0108 [1], <0.0116 [1], <0.0121 [1]

* - Treatment tests are identified by number in Table 4-1. Data from Tests 3, 5, and 6 were not used to calculate treatment standards.

** - Number in brackets indicates the number of sample sets for which that value was reported.

Table C-1 (Continued)

WASTE CONSTITUENTS DETECTED IN THE UNTREATED OR TREATED WASTES IN ONE OR MORE OF THE FOURTEEN INCINERATION TESTS

Waste Code	BDAT Number	Waste Constituent	Detected In Treatment Test Number*	Concentration In Untreated Waste (ppm)	Concentration In Ash (ppm)[# of sample sets]**	Concentration In Scrubber Water (ppm)[# of sample sets]**
POLYNUCLEAR AROMATIC WASTES (continued)						
U051	121	Creosote - Naphthalene	1	26,000 - 51,000	<0.5 [3]	<0.010 [4]
			2	29,000 - 43,000	<0.11 [7]	<0.002 [7]
			4	314 - 470	<2.0 [6]	<0.002 [6]
			7	93 - 170	<0.2 [6]	<0.010 [6]
			8	63,000 - 81,000	<1.0 [5]	<0.010 [8]
	139	Creosote - Pentachlorophenol	1	<1,000 - 2,300	<2.5 [3]	<0.050 [4]
	141	Creosote - Phenanthrene	1	28,000 - 42,000	<0.50 [3]	<0.010 [4]
			2	29,000 - 41,000	<0.36 [7]	<0.006 [7]
			4	11 - 21	<2.0 [6]	<0.002 [6]
			7	77 - 120	<0.2 [6]	<0.010 [6]
			8	15,000 - 41,000	<1.0 [5]	<0.010 [8]
			11	<0.351 - 1.27	<0.333 [5], <0.351 [1]	<0.0104 [1], <0.0106 [1], <0.0107 [1], <0.0108 [1], <0.0116 [1], <0.0121 [1]
	145	Creosote - Pyrene	1	9,200 - 15,000	<0.50 [3]	<0.010 [4]
			2	12,000 - 17,000	<0.13 [7]	<0.002 [7]
			7	31 - 74	<0.2 [6]	<0.010 [6]
			8	5,900 - 9,700	<1.0 [5]	<0.010 [8]
	43	Creosote - Toluene	1	10 - 41	<2.0 [3]	<0.002 [3]
			2	100 - 170	<10 [7]	<0.010 [7]
			3	2.3 - 3.6	<2.0 [7]	<0.002 [7]
			4	<2,000	<2.0 [6]	<0.002 [3], 0.0026 [1], 0.0032 [1], 0.0046 [1]
			5	<2.0 - 5.0	2.0 [2], 8.0 [1]	<0.002 [3], 0.002 [1], 0.003 [1], 0.004 [1]
			6	201 - 2,000	<2.0 [6]	<0.002 [8]
			7	22 - 120	<2.0 [5], 3.0 [1]	<0.004 [6]
			8	5.0 - 152	<0.025 [2], 0.085 [1], 0.15 [1], 0.19 [1]	<0.005 [5], 0.008 [2], 0.009 [1]
			9	<25 - 42	<0.005 [4]	<0.005 [4]
			10	5.4 - 23	<1.5 [4]	<0.005 [6]
			13	<0.021	<0.005 [3],0.010 [1]	<0.005 [3]
			14	69,000	<0.010 [4]	<0.005 [4]
215/ 216/ 217		Creosote - Xylenes (total)	1	12 - 130	<2.0 [3]	<0.002 [3]
			2	120 - 170	<10 [7]	<0.010 [7]
			3	<2.0 - 7.2	<2.0 [7]	<0.002 [7]
			5	<2.0	<2.0 [3]	<0.002 [5], 0.004 [1]
			7	<14 - 120	<2.0 [5], 5.8 [1]	<0.004 [6]
			8	3.0 - 123	<0.025 [5]	<0.005 [8]
			10	<1.5 - 5.3	<1.5 [4]	<0.005 [6]

* - Treatment tests are identified by number in Table 4-1. Data from Tests 3, 5, and 6 were not used to calculate treatment standards.

** - Number in brackets indicates the number of sample sets for which that value was reported.

Table C-1 (Continued)

WASTE CONSTITUENTS DETECTED IN THE UNTREATED OR TREATED WASTES IN ONE OR MORE OF THE FOURTEEN INCINERATION TESTS

Waste Code	BDAT Number	Waste Constituent	Detected In Treatment Test Number*	Concentration In Untreated Waste (ppm)	Concentration In Ash (ppm)[# of sample sets]**	Concentration In Scrubber Water (ppm)[# of sample sets]**
POLYNUCLEAR AROMATIC WASTES (continued)						
U120	108	Fluoranthene	1	13,000 - 21,000	<0.50 [3]	<0.010 [4]
			2	21,000 - 26,000	<0.15 [7]	<0.002 [7]
			8	<982 - 12,000	<1.0 [5]	<0.010 [8]
U137	116	Indeno(1,2,3-c,d)pyrene	8	2,100 - 3,100	<1.0 [5]	<0.010 [8]
			11	<0.351 - 0.41	<0.333 [5], <0.351 [1]	<0.0104 [1], <0.0106 [1], <0.0107 [1], <0.0108 [1], <0.0116 [1], <0.0121 [1]
U165	121	Naphthalene	1	26,000 - 51,000	<0.50 [3]	<0.010 [4]
			2	29,000 - 43,000	<0.11 [7]	<0.002 [7]
			4	314 - 470	<2.0 [6]	<0.002 [6]
			7	93 - 170	<0.20 [6]	<0.010 [6]
			8	63,000 - 81,000	<1.0 [5]	<0.010 [8]
ORGANO-NITROGEN COMPOUND WASTES						
U009	3	Acrylonitrile	3	0.41 - 0.95	<0.10 [7]	<0.10 [7]
U012	56	Aniline	4	1.2	<5.0 [6]	<0.005 [6]
U169	126	Nitrobenzene	4	0.027 - 8.2	<5.0 [6]	<0.005 [6]
U196	39	Pyridine	1	<5.0	<5.0 [3]	<0.005 [5], 0.061 [1]
MISCELLANEOUS HALOGENATED ORGANIC WASTES						
U025	68	Bis(2-chloroethyl)ether	4	280 - 340	<2.0 [6]	<0.002 [6]
U043	50	Vinyl chloride	11	<20,000	<0.01 [6]	<0.01 [5], 0.03 [1]
U045	15	Chloromethane	5	<2.0 - 40	<2.0 [3]	<0.002 [10]
U075	21	Dichlorodifluoromethane	5	<2.0	<2.0 [2], 23 [1]	<0.002 [9], 0.023 [1]
			7	<14 - 310	<2.0 [6]	<0.05 [6]
			11	<20,000	0.71 [1], 1.4 [1], 1.5 [1], 1.6 [1], 1.7 [1], 1.4 [1]	<0.01 [2], 0.29 [1], 0.36 [1], 0.4 [1], 0.44 [1]
U192	144	Pronamide	13	24,000	<0.33 [2], 0.36 [1], 0.31 [1]	<0.01 [2], <0.011 [2]

* - Treatment tests are identified by number in Table 4-1. Data from Tests 3, 5, and 6 were not used to calculate treatment standards.
** - Number in brackets indicates the number of sample sets for which that value was reported.

APPENDIX D

ACCURACY CORRECTION OF DATA

APPENDIX D

ACCURACY CORRECTION OF DATA

The treatment performance data and detection limit data used to determine treatment standards were adjusted to account for analytical interferences associated with the chemical matrices of the samples. Generally, treatment performance data were corrected for accuracy as follows: (1) a matrix spike recovery was determined for each BDAT List constituent; (2) an accuracy correction factor was determined for each of the above constituents by dividing 100 by the matrix spike recovery (percent) for that constituent; and (3) treatment performance data or detection limit data for each BDAT List constituent were corrected by multiplying the data for each constituent by its corresponding accuracy correction factor. The procedure for accuracy correction of the data is described in further detail below.

Matrix spike recoveries are developed by analyzing a sample of a treated waste for a constituent and then re-analyzing the sample after the addition of a known amount of the same constituent (i.e, spike) to the sample. The matrix spike recovery represents the total amount of constituent recovered after spiking, minus the initial concentration of the constituent in the sample, and the result divided by the spike concentration of the constituent. Duplicate matrix spikes were performed for some BDAT List constituents. If a duplicate matrix spike was performed for a constituent, the matrix spike recovery used for that constituent was the lower of the two values from the first matrix spike and the duplicate spike.

In cases where a matrix spike was not performed for a waste constituent in the treatment test from which the detection limit was taken, the matrix spike recovery from a similar constituent from the treatment test was transferred to the constituent.

For some multi-source leachate (F039) constituents, treatment performance data were transferred from F, D, or K wastes. In these cases, when a matrix spike was not performed for a particular constituent, the matrix spike recovery for each constituent was derived from the average matrix spike recoveries of the appropriate analytical fraction (e.g., volatile or semivolatile organics) for which recovery data were available. First, the matrix spike recoveries for all volatile or semivolatiles from the first matrix spike were averaged. An average matrix spike recovery was then calculated for the duplicate matrix spike recoveries. The lower of the two average matrix spike recoveries was used to calculate the accuracy correction factor for the constituent.

An accuracy correction factor was determined for each constituent by dividing 100 by the matrix spike recovery (percent) for that constituent. An accuracy correction factor of 1.00 was used when both the matrix spike and duplicate matrix spike recoveries exceeded 100%, so that the data were not adjusted to concentrations below the detection limits. Matrix spike values of less than 20% are not acceptable and were not used to correct detection limits, nor included in calculating average matrix spike recoveries.

Table D-1 presents the matrix spike recoveries obtained in each of the 11 incineration tests. Table D-2 presents the accuracy correction of data from the ethylene dibromide (EDB) incineration test. For accuracy correction of data other than that from the 11 incineration tests or the EDB test, refer to the appropriate background document. Matrix spike recoveries and accuracy correction factors used for each U and P waste and multi-source leachate (F039) constituent included in this document are presented in Tables 6-1 through 6-3.

TABLE D-1

MATRIX SPIKE PERCENT RECOVERIES IN ASH FROM ELEVEN INCINERATION TESTS *

BDAT No.	Constituent	Test 1	Test 2	Test 4	Test 7	Test 8	Test 9	Test 10	Test 11	Test 13	Test 14
	Volatile Organics:										
1	Acetonitrile										
2	Acrolein										
3	Acrylonitrile										
4	Benzene	88,88	78,88	90,85	88	100,98	102,106	104,108	126,130	117,156	103,97
9	Chlorobenzene	124,120	102,112	99,100	46	106,106	104,110	106,110	90,108	92,56	115,109
22	1,1-Dichloroethane					114,114	100,96	126,130			
24	1,1-Dichloroethylene		86,95	85,78	96	114,114	100,96	126,130	80,122	35,32	75,73
229	Methyl isobutyl ketone									88,117	48,43
38	Methylene Chloride									300,309	120,124
43	Toluene	108,108	99,110		80	106,104	106,116	112,114	170,222	243,153	109,93
45	1,1,1-Trichloroethane									539,866	109,110
47	Trichloroethylene	88,84	67,77	107,112	76	114,114	116,126	112,116	178,216	210,294	109,103
215-217	Total Xylenes									61,23	92,91
	Semivolatile Organics:										
51	Acenaphthalene						41,39	73,74			
52	Acenaphthene	120,120	0,3.4	110,110	66,63	93,91			30,88	51,24	60,54
70	Bis(2-ethylhexyl)phthalate									86,78	78,71
73	2-sec-Butyl-4,6-dinitrophenol		113,88							65,13	41,41
76	p-Chloro-m-cresol	90,95	35,68	110,120	56,57	92,87	47,44	66,64	98,135	88,84	90,79
78	2-Chlorophenol	100,105	59,53	98,100	70,70	78,83	41,39	62,58	78,102	49,42	53,41
87	p-Dichlorobenzene				75,76						
88	o-Dichlorobenzene	94,94	48,46	90,99		79,89	40,39	75,70	72,90	26,23	29,17
102	2,4-Dinitrotoluene	120,120	0,0	107,110	54,52	121,109	48,47	58,58	38,100	73,56	71,63
105	Di-n-propylnitrosamine	81,82	67,62	120,130	70,70	82,84	46,45	64,61	110,118	58,50	53,46
110	Hexachlorobenzene									54,21	74,139
117	Isosafrole									34,28	44,39
127	4-Nitrophenol	100,90	1.2,2.6	97,110	32,31	37,35	33,32	22,21	50,90	91,48	77,64
130	Pentachlorophenol	95,105	0,0	88,88	34,34	7,11	30,25	38,35	27,64	74,0	77,69
142	Phenol	85,80	72,65	90,97	65,65	77,80	41,40	65,61	101,122	70,61	70,60
144	Pronamide									99,69	92,84
145	Pyrene	96,100	0,0	120,92	58,53	34,39	46,45	85,79	6,82	49,0	73,66
150	1,2,4-Trichlorobenzene	95,100	30,30	75,80	90,86	84,89	41,39	75,76	60,90	30,25	36,24
	Organochlorine Pesticides:										
176	gamma-BHC		62,75								
181	Dieldrin										
186	Heptachlor									54,28	88,93
187	Heptachlor epoxide		75,88								
190	Methoxychlor		118,145							16,0	0,42
	Phenoxyacetic Acid Herbicides:										
192	2,4-Dichlorophenoxyacetic acid		42,69							0,0	0,0
193	Silvex (2,4,5-TP)									0,0	0,0
194	2,4,5-T									0,0	0,0

* No matrix spike recovery data was collected for the ash from incineration test 12.

Table D-2

ACCURACY CORRECTION OF ETHYLENE DIBROMIDE INCINERATION TREATMENT PERFORMANCE DATA

BDAT List Constituent	Uncorrected Data (ppm)			Matrix Spike	Accuracy Correction Factor	Accuracy-Corrected Data (ppm)			Average Accuracy-Corrected Data (ppm)
	Sample Set					Sample Set			
	#1	#2	#3			#1	#2	#3	
Ethylene Dibromide (1,2-Dibromoethane)	5	5	5	92.5%	1.08	5.41	5.41	5.41	5.41

Source: EDB Test Burn Program Emissions Test Results (Reference 18).

APPENDIX E

VARIABILITY FACTOR CALCULATIONS

APPENDIX E

VARIABILITY FACTOR CALCULATIONS

As noted in Section 6.1, the variability factor accounts for the variability inherent in treatment system performance, treatment residual collection, and treatment sample analysis. For more information on calculation of variability factors, see EPA's Methodology for Developing BDAT Treatment Standards (Reference 2).

A variability factor was calculated for a constituent when the test from which the detection limit was transferred contained the constituent at concentrations above the detection limit in the treatment residual (ash). The variability factor and the data used to calculate it are shown in Table E-1 for U240 nonwastewaters. For some multi-source leachate (F039) constituents for which treatment performance data were transferred from F, D, or K wastes, a variability factor was calculated. For these constituents, the variability factor calculations can be found in the background document for the waste from which data were transferred.

Table E-1

VARIABILITY FACTOR CALCULATION FOR U240 NONWASTEWATERS

INPUT DATA:

Constituent: 2,4-Dichlorophenoxyacetic acid
BDAT Number: 192
Accuracy Correction Factor: 5.00

Sample Set	Unadjusted Value (ppm)	A or DL	Adjusted Value (ppm)	ln of Adjusted Values
1	0.021	A	0.105	-2.25379
2	0.2	DL	1.0	0
3	0.2	DL	1.0	0
4	0.2	DL	1.0	0

RESULTS:

Mean of Adj Values: 0.7763
Mean of lns: -0.5634
STD of lns: 1.1269
C99: 7.8634
VF: 10.1300

A - Actual value detected in treatment residual.
DL - Detection limit (not detected above the detection limit in the treatment residual).